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APR 78 E J KOENKE

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Volume IIIA.  
**APPENDICES**

A - E.

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## Technical Report Documentation Page

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16. Abstract <p>A unique airborne aircraft collision avoidance system concept is presented which assures adequate separation from the largest possible percentage of potential collision threats. The concept operates in all airspace as a compatible backup to the present and evolving ATC system, and is acceptable to the pilot and the user community. The system concept capitalizes on the aviation community's large existing investment in ATCRBS transponders and on the ground based beacon surveillance system network for the basic sources of the collision avoidance information. <i>The appendices in this volume include:</i></p> <p>The report is contained in three volumes; an Executive Summary (I), Concept Description (II) and Appendices (III-A &amp; III-B)</p> <p style="text-align: right;"><i>(cont on p. iii)</i></p>		
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## APPENDIX A

### GARBLE

#### A.1 INTRODUCTION

In its simplest form radio frequency garble occurs whenever two signals arrive at the same receiver simultaneously or close enough in time that the signals interfere. When the condition persists with many repetitions of the overlapped signals, it is synchronous garble. Figure A-1 illustrates three overlapping replies from aircraft #2, #3, and #4 during one 20.3  $\mu$ s transponder reply period. This analysis is concerned only with replies on 1090-MHz since the 1030-MHz interrogation frequency is relatively uncluttered. The 1090-MHz replies are omnidirectional from all aircraft in any radar's mainbeam (and nonsuppressed sidelobes) causing the BCAS to receive replies from each aircraft replying to each radar (passive garble). In a low density environment with only one or two interrogation overlaps at a maximum, relatively simple tracking algorithms can separate or "de-interleave," the fourteen discrete pulses of each signal during the 20.3  $\mu$ s interrogation period. But in dense traffic with more than 5 or 6 overlaps, passive tracking



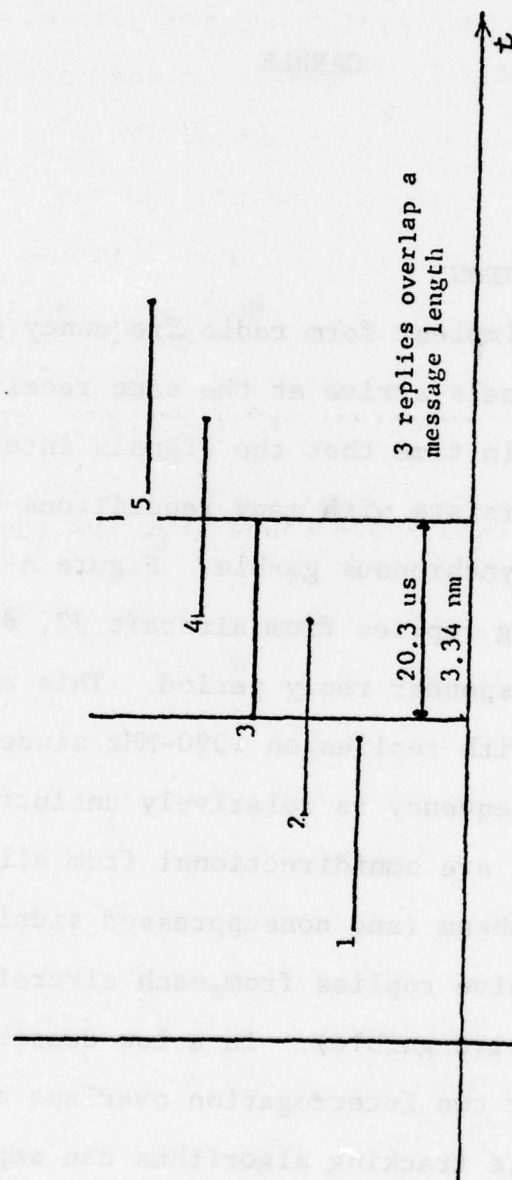


Figure A-1: Garble Phenomenon



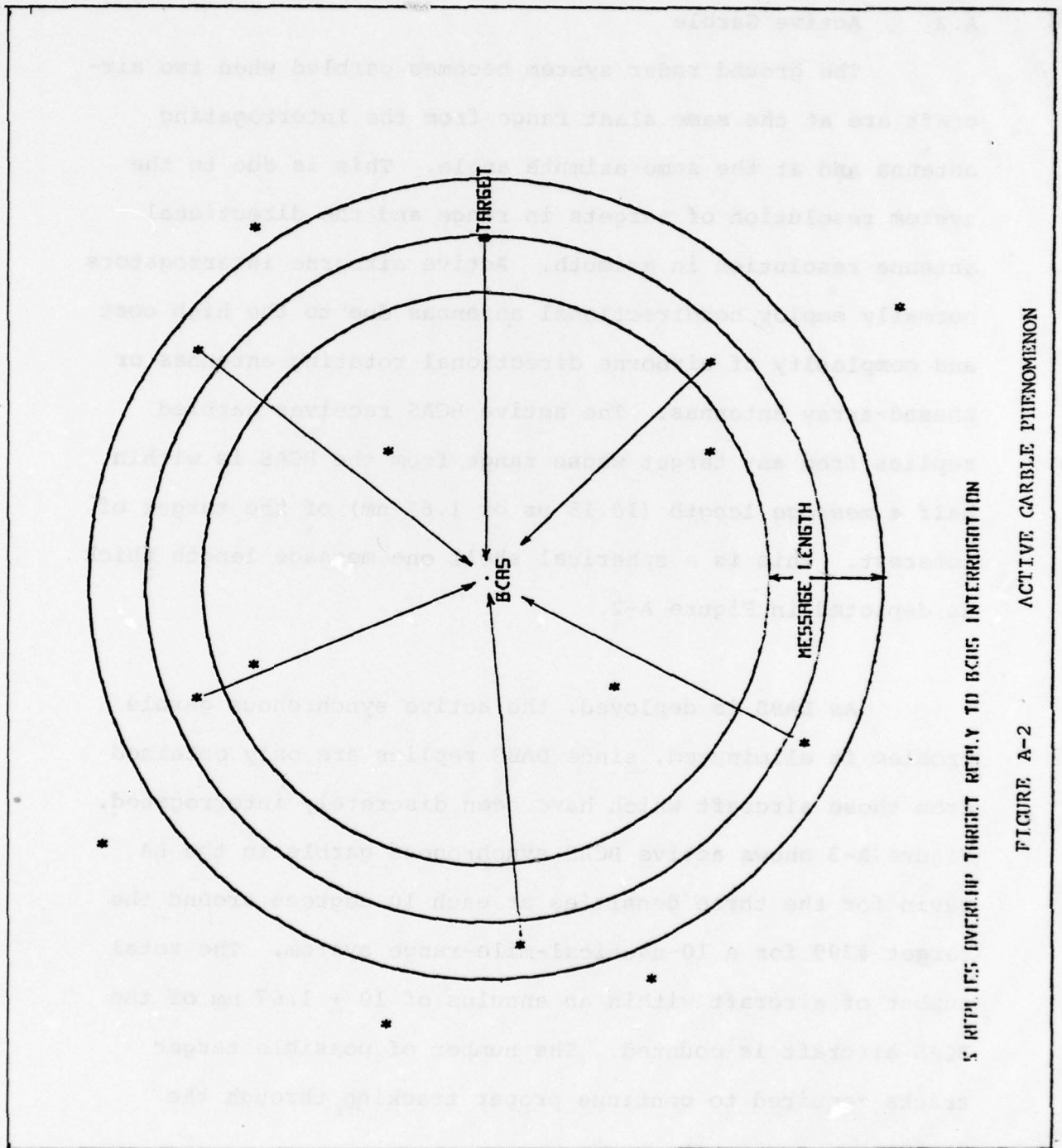
becomes next to impossible. The same is true for active tracking at a somewhat higher level of garble.

#### A.2 Active Garble

The ground radar system becomes garbled when two aircraft are at the same slant range from the interrogating antenna and at the same azimuth angle. This is due to the system resolution of targets in range and the directional antenna resolution in azimuth. Active airborne interrogators normally employ nondirectional antennas due to the high cost and complexity of airborne directional rotating antennas or phased-array antennas. The active BCAS receives garbled replies from any target whose range from the BCAS is within half a message length (10.15 us or 1.67 nm) of the target of interest. This is a spherical shell one message length thick as depicted in Figure A-2.

As DABS is deployed, the active synchronous garble problem is eliminated, since DABS replies are only obtained from those aircraft which have been discretely interrogated. Figure A-3 shows active BCAS synchronous garble in the LA Basin for the three densities at each 10 degrees around the target #399 for a 10-nautical-mile-range system. The total number of aircraft within an annulus of  $10 \pm 1.67$  nm of the BCAS aircraft is counted. The number of possible target tracks required to continue proper tracking through the



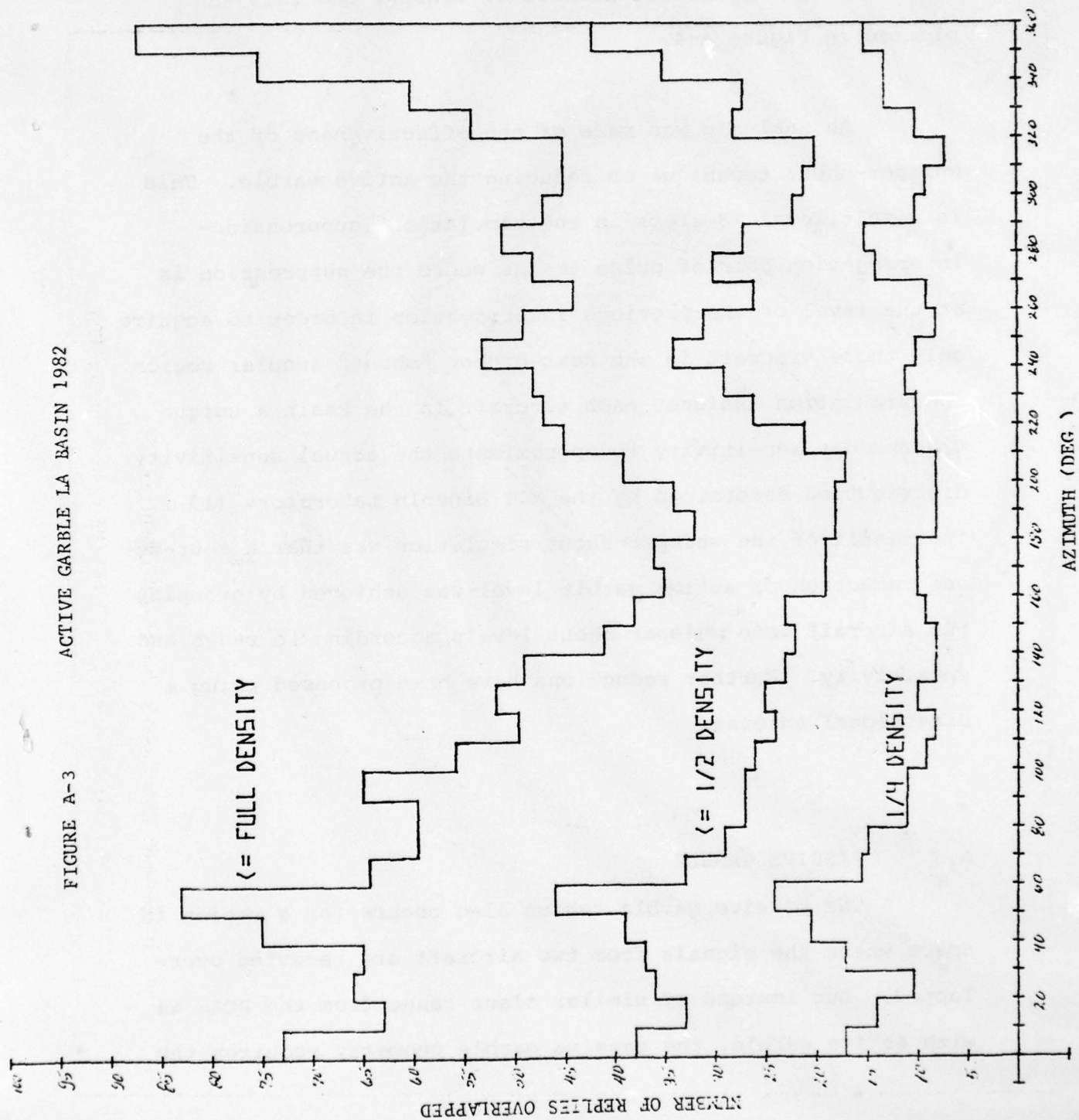


5 RPT. ITS OVERLAP THREAT REPLY TO BCRS INTERROGATION

FIGURE A-2 ACTIVE CABLE PHENOMENON



FIGURE A-3 ACTIVE GARBLE LA BASIN 1982





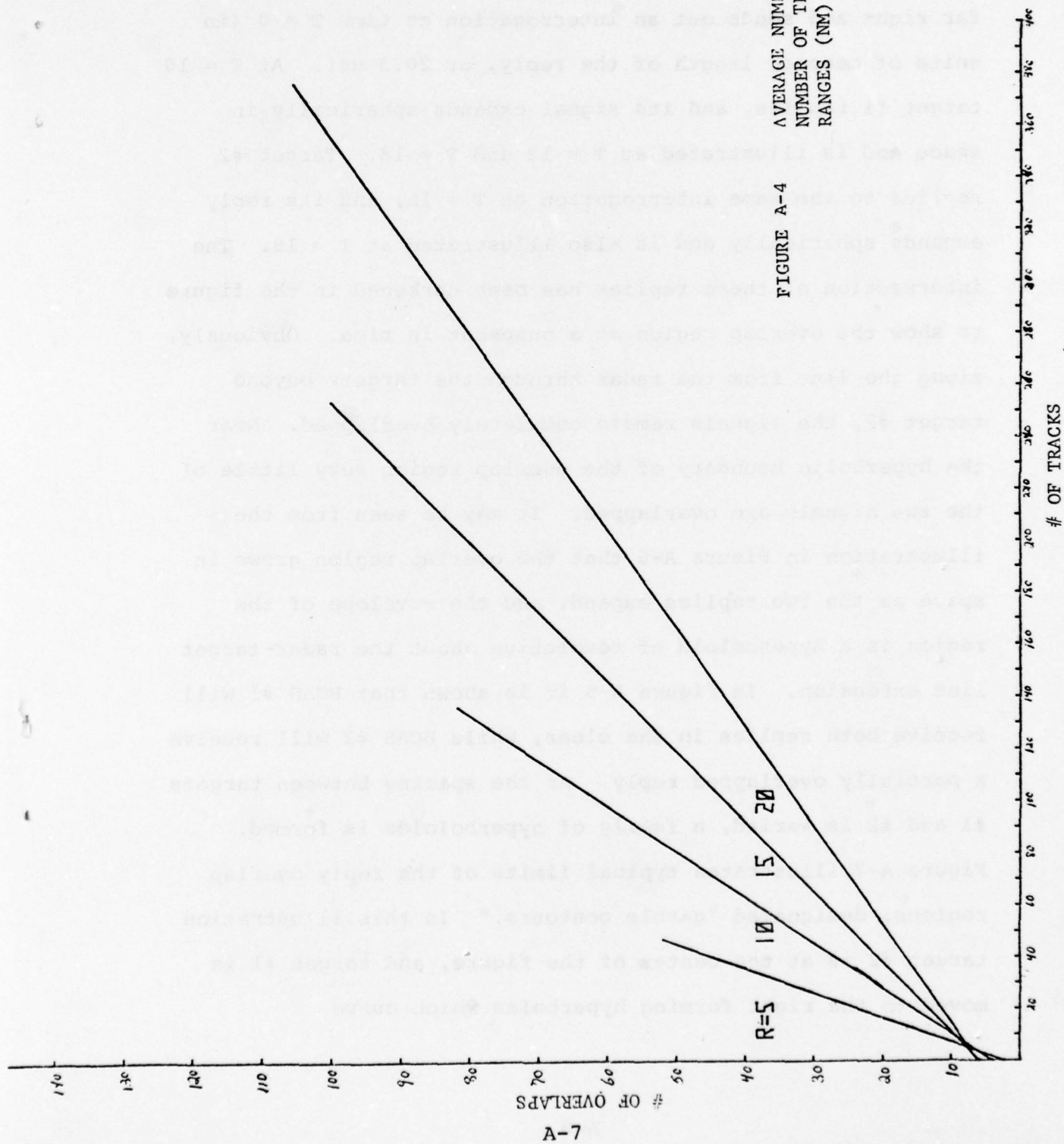
maximum number of overlaps was plotted for 5, 10, 15 and 20 nm active systems. An average of these maximum overlaps was determined for different numbers of tracks, and this was plotted in Figure A-4.

An analysis was made of the effectiveness of the whisper-shout technique on reducing the active garble. This is a multilevel (8 steps in the simulation) suppression-interrogation pair of pulse trains where the suppression is at the level of the previous interrogation in order to acquire only those aircraft in the next higher "shout" annular region. The simulation assigned each aircraft in the Basin a unique transponder sensitivity to approximate the actual sensitivity distribution determined by the MIT Lincoln Laboratory (13). The result of the whisper-shout simulation was that a four-to-one reduction of active garble level was achieved by grouping the aircraft into whisper shout levels according to range and sensitivity. Further reductions have been proposed using a directional antenna.

### A.3 PASSIVE GARBLE

The passive garble region also occurs for a region in space where the signals from two aircraft are received overlapped. But instead of similar slant range from the BCAS as with active garble, the passive garble geometry requires the







two aircraft to be in the same ground radar main beam and have equal reply times of arrival at the BCAS aircraft. Figure A-5 illustrates this phenomenon. The radar is at the far right and sends out an interrogation at time  $T = 0$  (in units of message length of the reply, or 20.3 us). At  $T = 10$  target #1 replies, and its signal expands spherically in space and is illustrated at  $T = 12$  and  $T = 18$ . Target #2 replies to the same interrogation at  $T = 16$ , and its reply expands spherically and is also illustrated at  $T = 18$ . The intersection of these replies has been darkened in the figure to show the overlap region at a snapshot in time. Obviously, along the line from the radar through the targets beyond target #2, the signals remain completely overlapped. Near the hyperbolic boundary of the overlap region very little of the two signals are overlapped. It may be seen from the illustration in Figure A-6 that the overlap region grows in space as the two replies expand, and the envelope of the region is a hyperboloid of revolution about the radar-target line extension. In Figure A-5 it is shown that BCAS #1 will receive both replies in the clear, while BCAS #2 will receive a partially overlapped reply. As the spacing between targets #1 and #2 is varied, a family of hyperboloids is formed. Figure A-7 illustrates typical limits of the reply overlap regions, designated "garble contours." In this illustration target #2 is at the center of the figure, and target #1 is moved to the right forming hyperbolas which curve



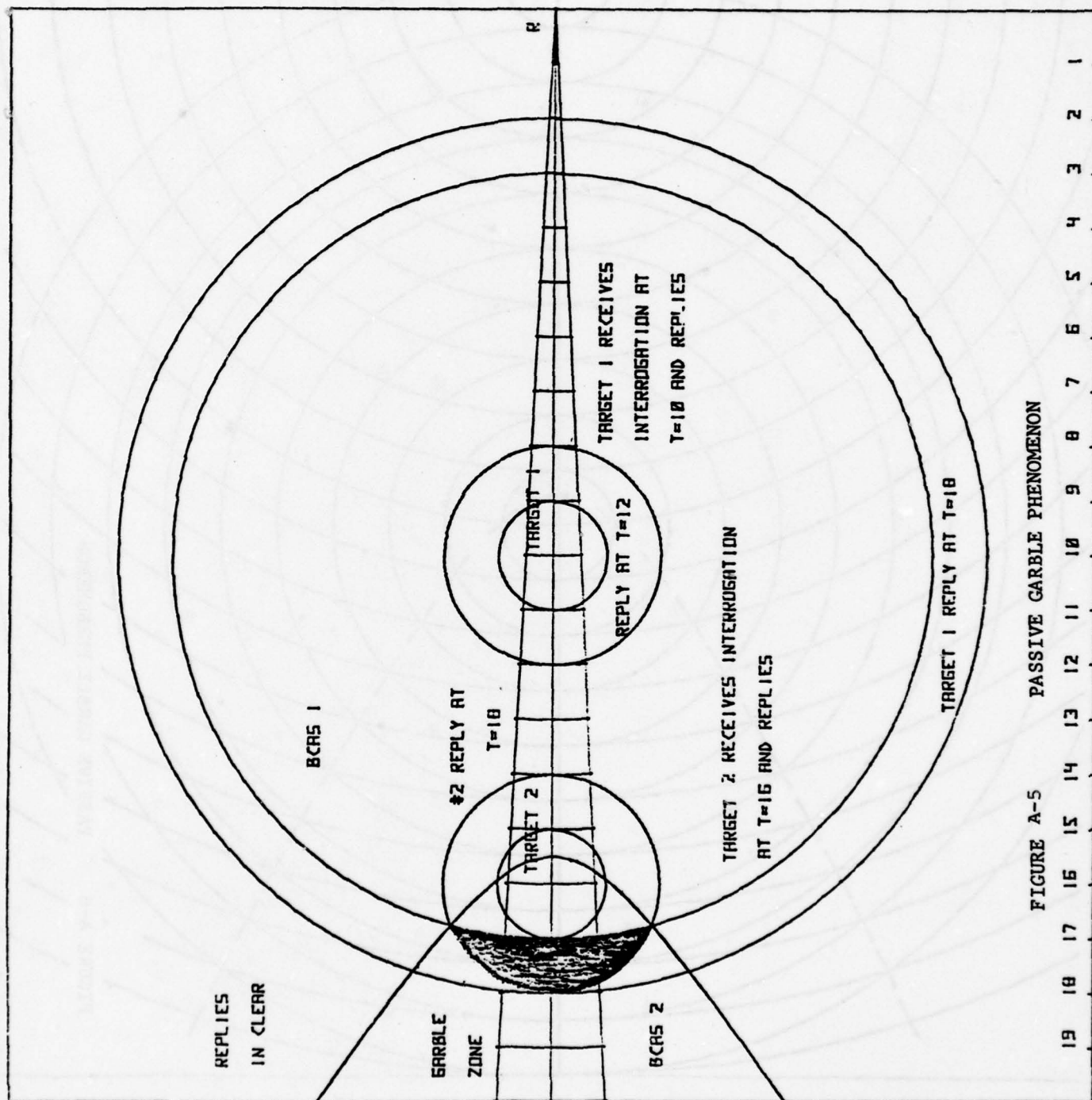


FIGURE A-5 PASSIVE GARBLE PHENOMENON



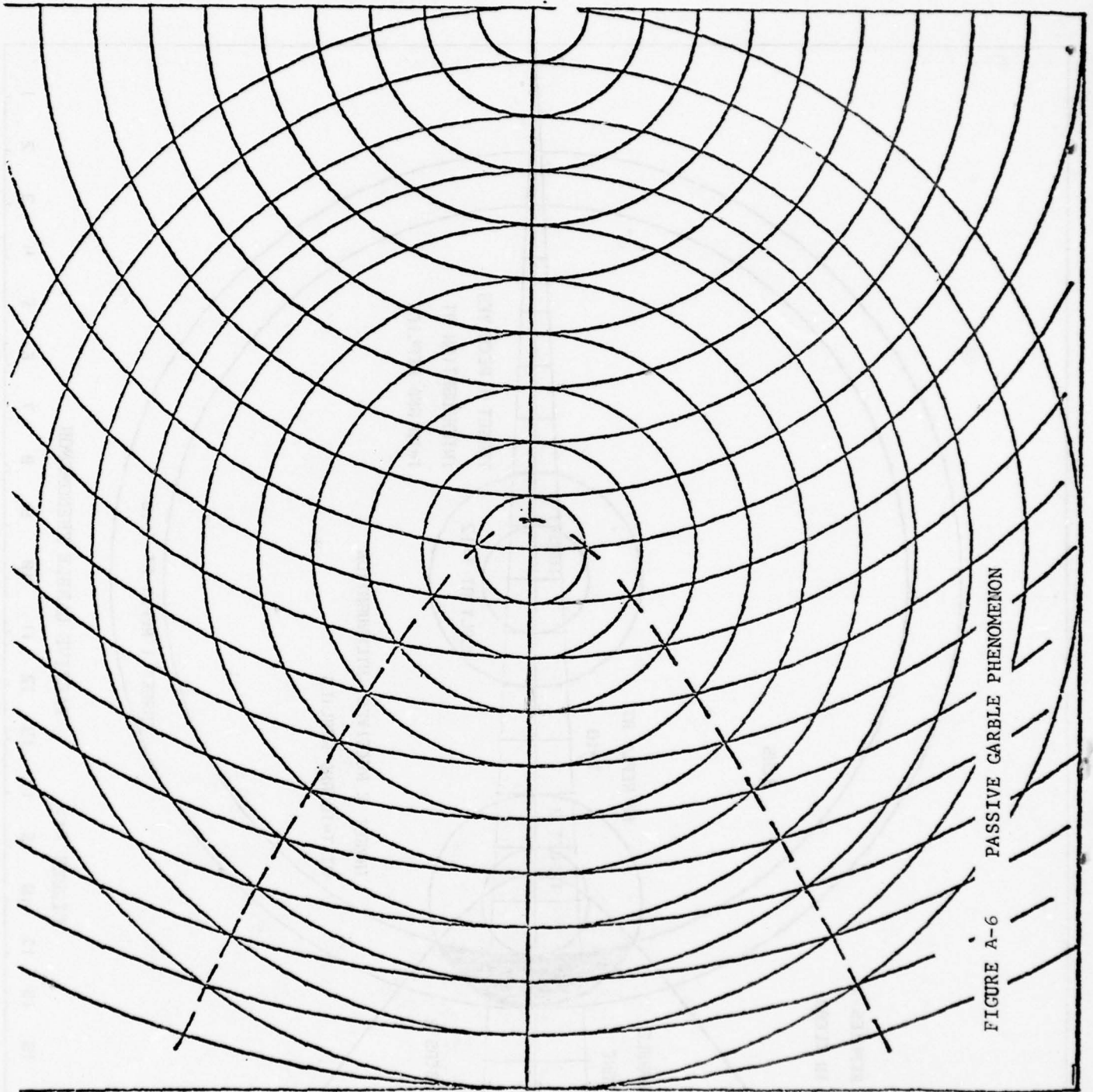


FIGURE A-6 PASSIVE CARBLE PHENOMENON



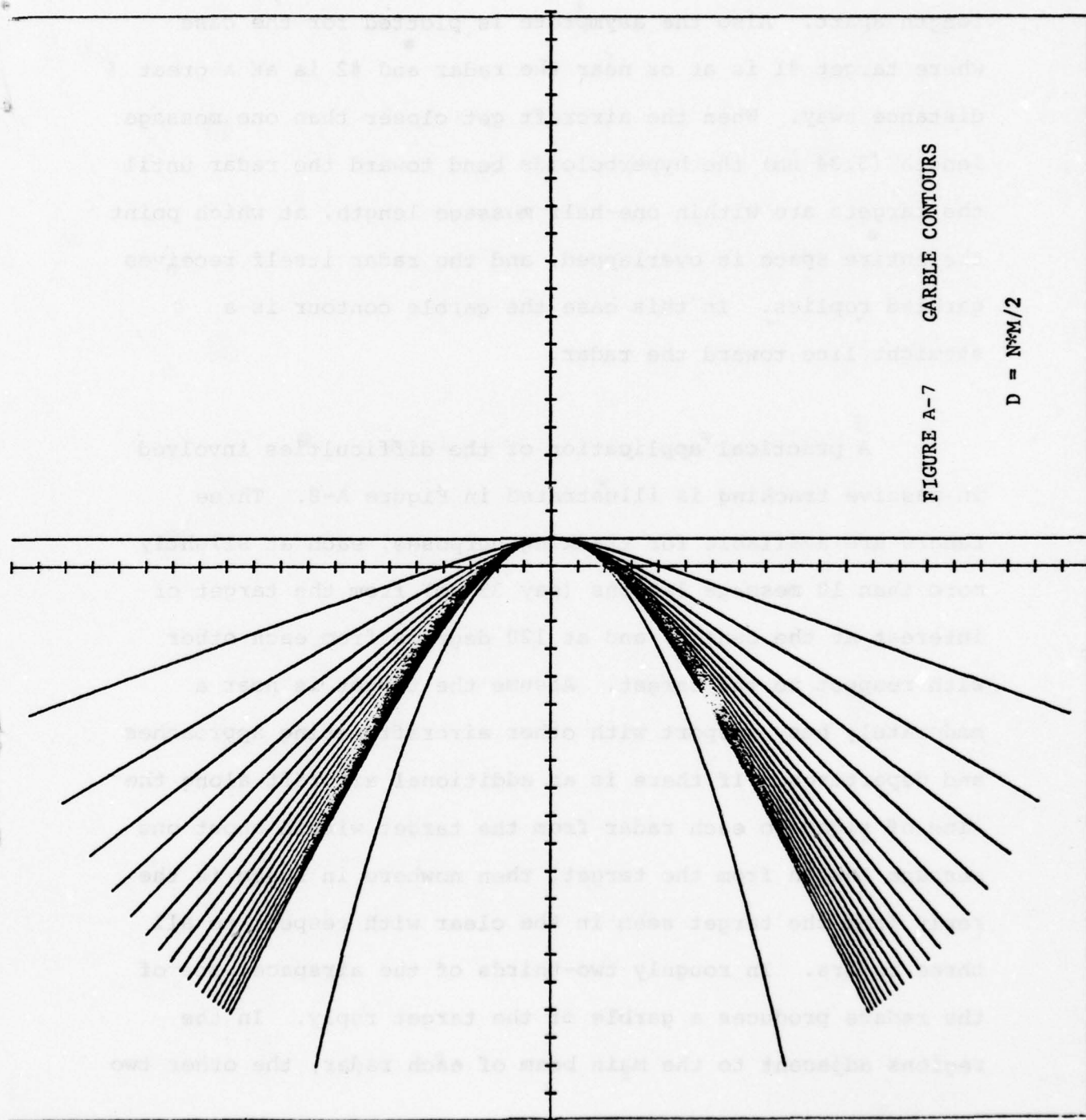


FIGURE A-7 GARBLE CONTOURS

$$D = N^2 M / 2$$



progressively further to the left. Note that the vertical line represents a garble region (the entire left-hand half space) for the case where the two targets are one full message length apart. Also the asymptote is plotted for the case where target #1 is at or near the radar and #2 is at a great distance away. When the aircraft get closer than one message length (3.34 nm) the hyperboloids bend toward the radar until the targets are within one-half message length, at which point the entire space is overlapped, and the radar itself receives garbled replies. In this case the garble contour is a straight line toward the radar.

A practical application of the difficulties involved in passive tracking is illustrated in Figure A-8. Three radars are available for tracking purposes, each at slightly more than 10 message lengths (say 35 nm) from the target of interest at the center, and at 120 degrees from each other with respect to the target. Assume the target is near a moderately busy airport with other aircraft making approaches and departures. If there is an additional aircraft along the line of sight to each radar from the target within about one message length from the target, then nowhere in space is the reply from the target seen in the clear with respect to all three radars. In roughly two-thirds of the airspace, one of the radars produces a garble of the target reply. In the regions adjacent to the main beam of each radar, the other two



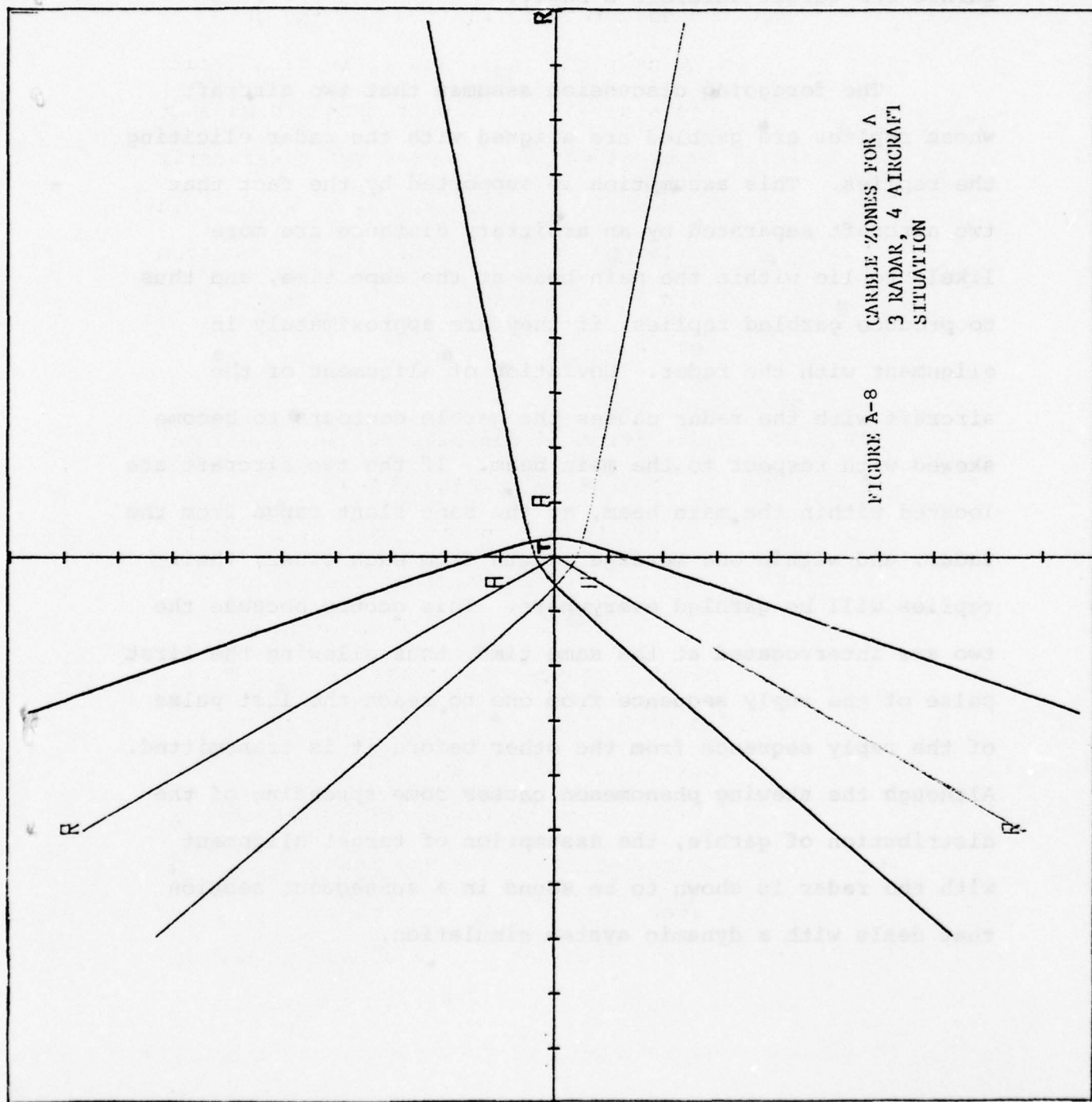


FIGURE A-8  
CABLE ZONES FOR A  
3 RADAR, 4 AIRCRAFT  
SITUATION



radars cause the replies of the target to be garbled by aircraft in the main beam. And in the small area adjacent to the target, all three radars cause the other aircraft's replies to garble the target aircraft's reply.

The foregoing discussion assumes that two aircraft whose replies are garbled are aligned with the radar eliciting the replies. This assumption is supported by the fact that two aircraft separated by an arbitrary distance are more likely to lie within the main beam at the same time, and thus to produce garbled replies, if they are approximately in alignment with the radar. Deviation of alignment of the aircraft with the radar causes the garble contours to become skewed with respect to the main beam. If the two aircraft are located within the main beam, at the same slant range from the radar, and within one message length from each other, their replies will be garbled everywhere. This occurs because the two are interrogated at the same time, thus allowing the first pulse of the reply sequence from one to reach the last pulse of the reply sequence from the other before it is transmitted. Although the skewing phenomenon causes some spreading of the distribution of garble, the assumption of target alignment with the radar is shown to be sound in a subsequent section that deals with a dynamic system simulation.

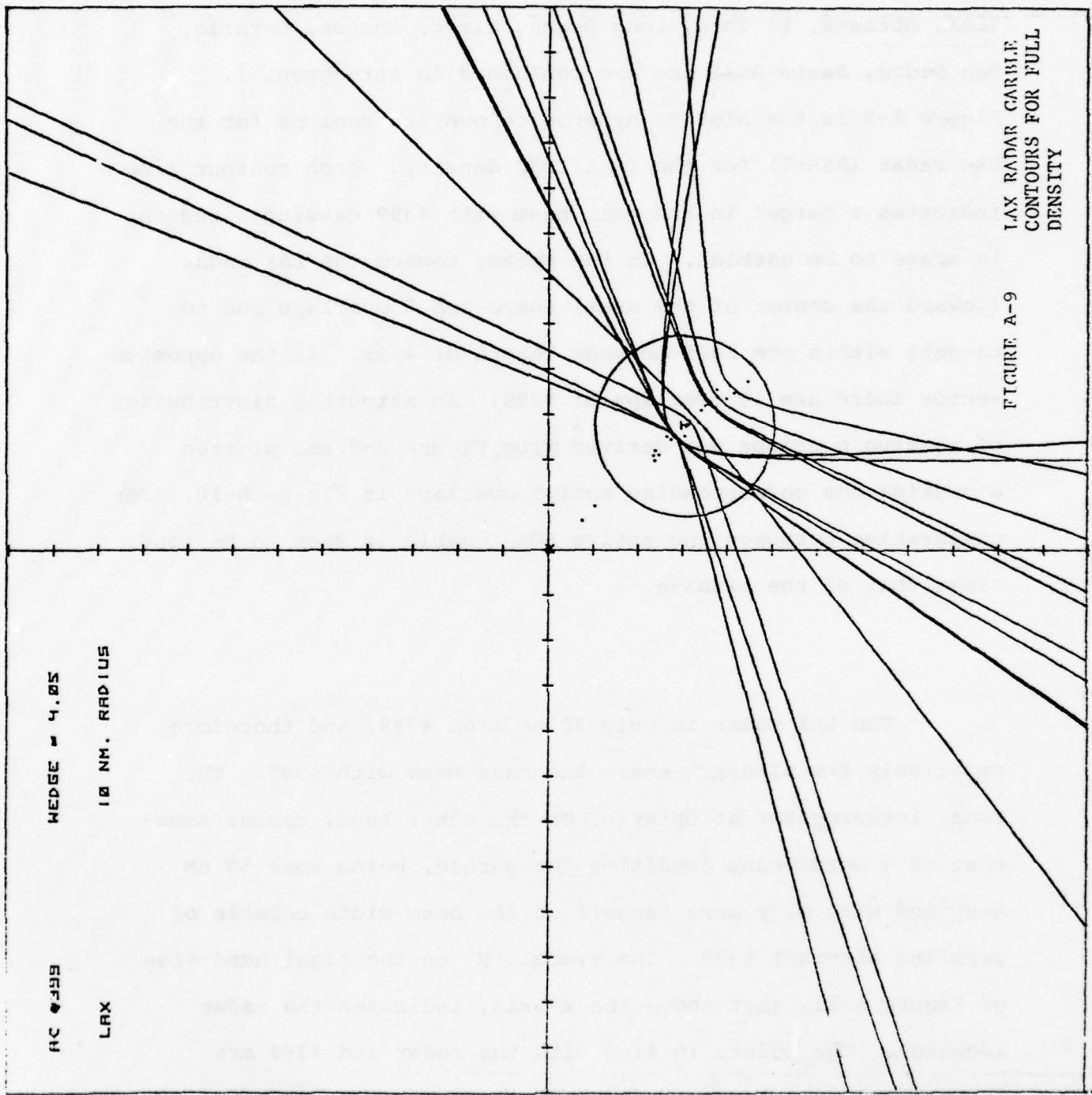


#### A.4 STATIC SIMULATION OF LA BASIN PASSIVE GARBLE

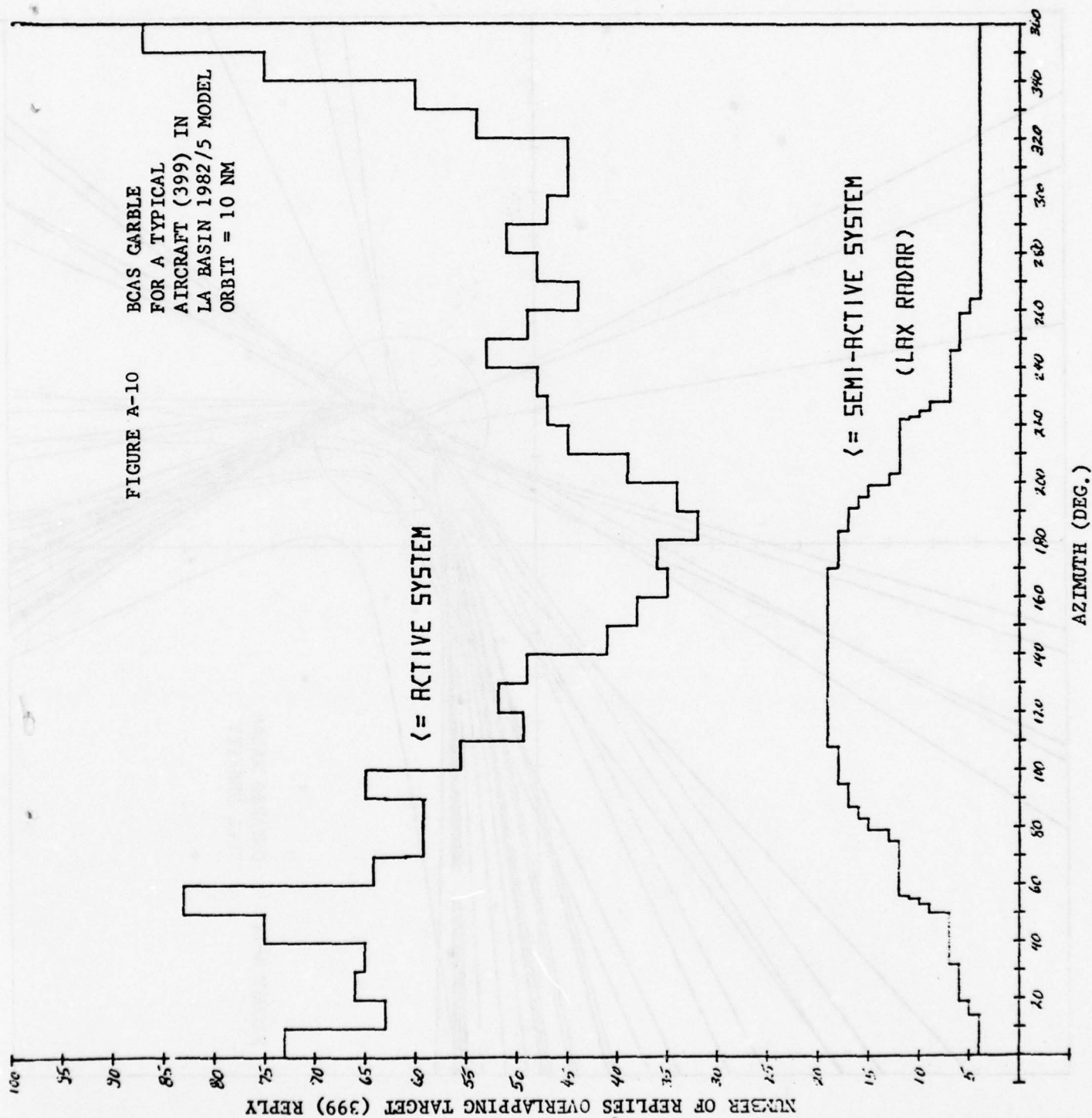
The passive garble contours for target #399 in the LA Basin were plotted with respect to each of 9 radars (LAX, Burbank, El Toro, Long Beach, March, Norton, Ontario, San Pedro, Santa Ana) and are contained in Attachment I. Figure A-9 is the plot of hyperbolic overlap regions for the LAX radar (ASR-7) for the full 1982 density. Each contour line indicates a target in the main beam with #399 causing a region in space to be garbled. In the sector toward the LAX radar (toward the center of the axes) there are 5 overlaps due to targets within one half message length of #399. In the opposite sector there are 19 overlaps of #399. An azimuthal distribution of passive overlaps was derived from Figure A-9 and plotted alongside the corresponding active overlaps in Figure A-10. For comparative purposes the active BCAS garble is seen to be four times that of the passive.

The LAX radar is only 20 nm from #399, and therefore relatively few aircraft share the main beam with #399. The radar interrogator at Ontario, on the other hand, causes somewhat of a worst-case condition for garble, being some 50 nm away and with many more targets in the beam width capable of garbling aircraft #399. The symbol "R" on the right hand side of Figure A-11, just above the x-axis, indicates the radar location. The points in line with the radar and #399 are targets illuminated by the main beam as the radar sweeps

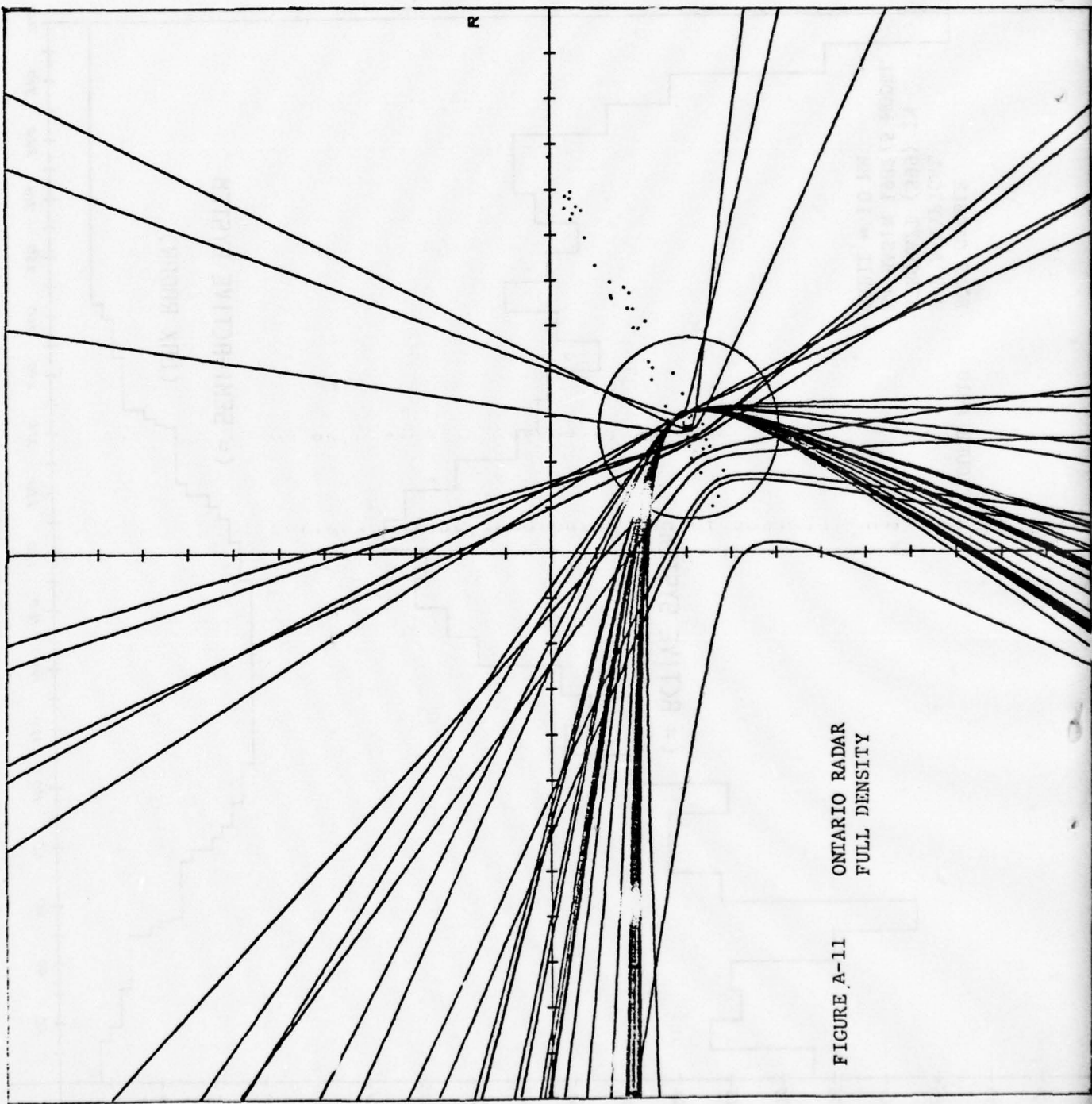










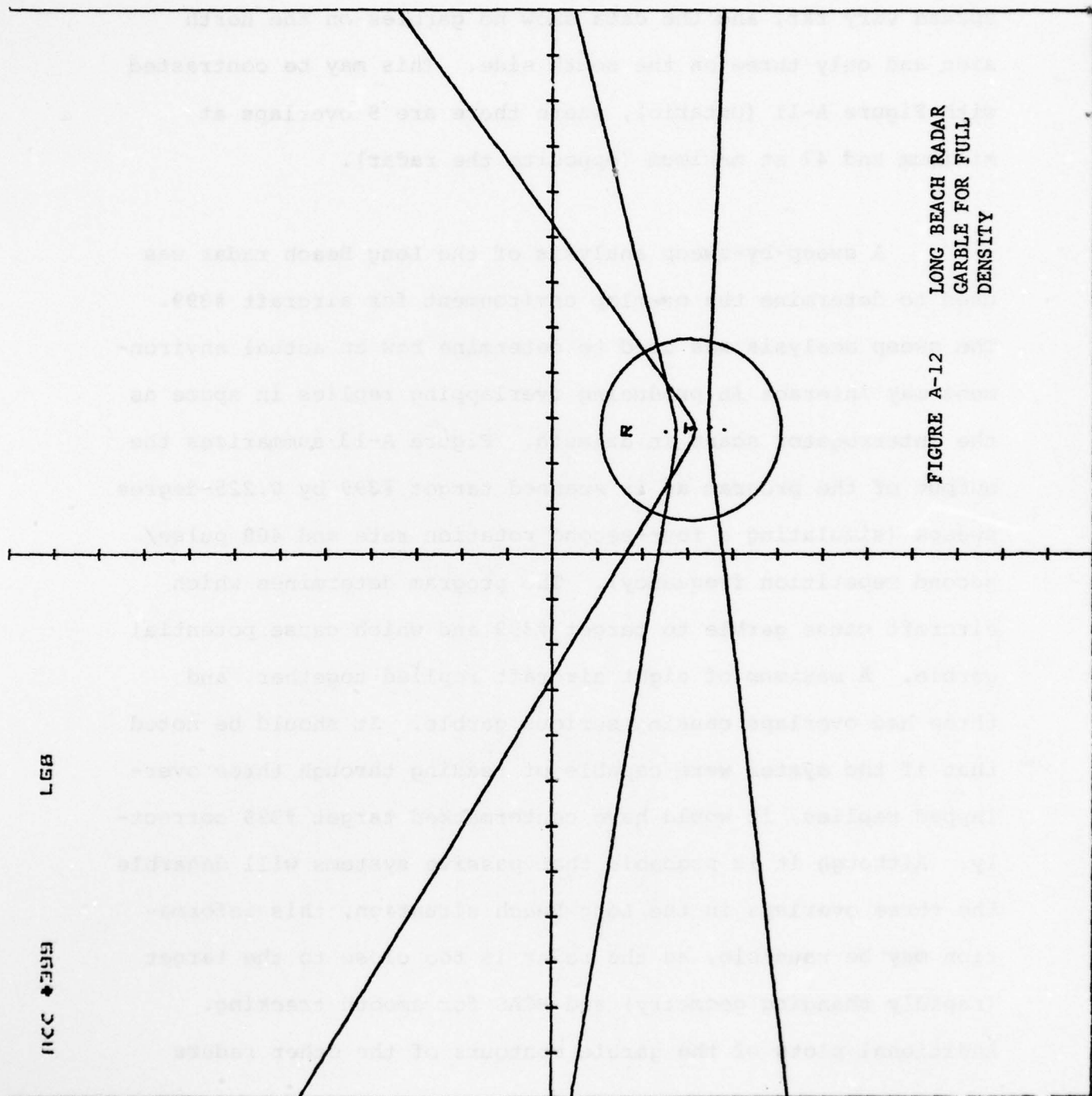




past #399 with the 4-degree beam centered on #399. The opposite situation is illustrated in Figure A-12; where the Long Beach ASR is very close (about 8 nm), the beam has not spread very far, and the data show no garbles on the north side and only three on the south side. This may be contrasted with Figure A-11 (Ontario), where there are 9 overlaps at minimum and 47 at maximum (opposite the radar).

A sweep-by-sweep analysis of the Long Beach radar was used to determine the overlap environment for aircraft #399. The sweep analysis was used to determine how an actual environment may interact in producing overlapping replies in space as the interrogator scans in azimuth. Figure A-13 summarizes the output of the program as it scanned target #399 by 0.225-degree sweeps (simulating a four-second rotation rate and 400 pulse/second repetition frequency). The program determines which aircraft cause garble to target #399 and which cause potential garble. A maximum of eight aircraft replied together, and three had overlaps causing serious garble. It should be noted that if the system were capable of reading through three overlapped replies, it would have centermarked target #399 correctly. Although it is probable that passive systems will degarble the three overlaps in the Long Beach situation, this information may be unusable, as the radar is too close to the target (rapidly changing geometry) and BCAS for smooth tracking. Additional plots of the garble contours of the other radars





LONG BEACH RADAR  
GARBLE FOR FULL  
DENSITY

FIGURE A-12



# LONG BEACH RADAR

SWEEP #	389	390	393	394	395	396	398	399	400	401	402	431	# OF TGT OVERLAPS	# OF AIRCRAFT
1							G	G	G	P	P		2	5
2							G	G	G	P	P		2	5
3							G	G	G	P	P		2	5
4							G	G	G	P			2	4
5						G	G	G	G	P		P	3	6
6						G	G	G	G	P		P	3	6
7						G	G	G	G	P		P	3	6
8					P	G	G	G	G	P		P	3	7
9					P	G	G	G	G	P		P	3	7
10					P	G	G	G		P		P	2	6
11				P	P	G	G	G		P		P	2	7
12				P	P	G	G	G		P		P	2	7
13				P	P	G	G			P		P	1	6
14				P	P	G	G			P		P	1	6
15				P	P	G	G					P	1	5
16			P	P	P	G	G					P	1	6
17			P	P	P	G	G					P	1	6
18	P	P	P	P	P	G	G					P	1	8
19	P	P	P	P	P	G	G					P	1	8

G = GARBLE EVERYWHERE  
P = POTENTIAL GARBLE  
H = CLEAR REPLY

FIGURE A-13 LONG BEACH RADAR PASSIVE GARBLE WEDGER OUTPUT



are presented in Attachment 1 in order of decreasing target density.

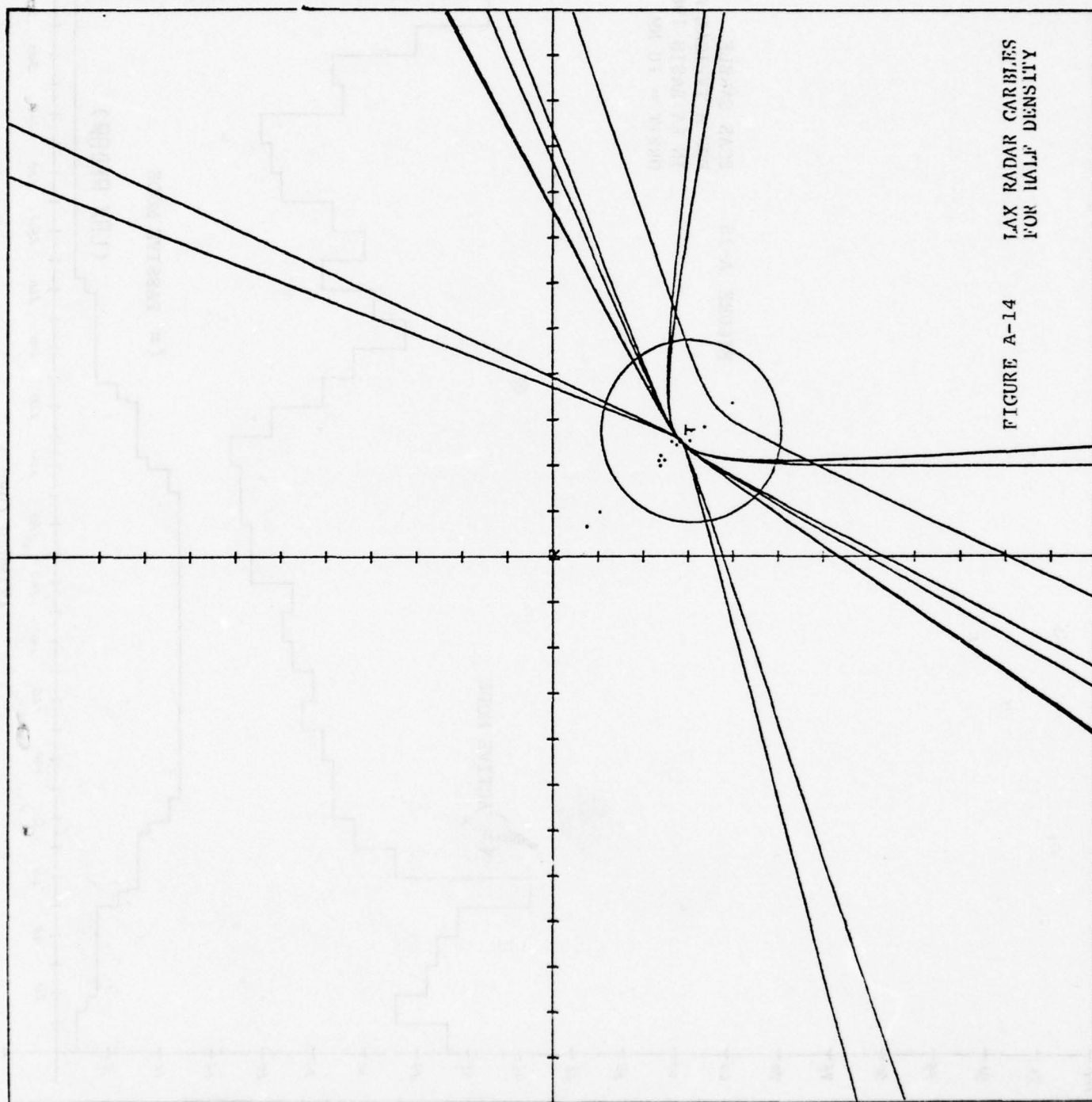
#### A.5      STATIC SIMULATION OF LA BASIN, HALF DENSITY

An analysis similar to that in Section A.3 was conducted using the half-density traffic model of 382 targets. Figure A-14 shows that the garble contours have been roughly halved. Figure A-15 compares the active and passive half-density garble levels for various azimuth angles around aircraft #399. The ratio of active to passive garble has remained at the same 4-to-1 as in the full-density model. The half-density Long Beach garble contour is given in Figure A-16, showing a significantly improved garble environment. But now a tracker that uses only information "in the clear" (ungarbled) as being positively identified would cause an error of 0.5 degree in centermarking the azimuth to #399. Figure A-17 summarizes program output on a sweep-by-sweep basis.

#### A.6      STATIC SIMULATION OF LA BASIN, QUARTER DENSITY

Again, a complete analysis as in Section A.3 was conducted for the quarter-density traffic model with 177 targets. Figures A-18 through A-21 show these results. It is significant to point out that once again the garble environment has improved for the Long Beach radar, yet the centermark error has worsened, further degrading its usefulness. A one-degree





LAX RADAR CARBLES  
FOR HALF DENSITY

FIGURE A-14



NUMBER OF REPLIES OVERLAPPING TARGET (399) REPLY

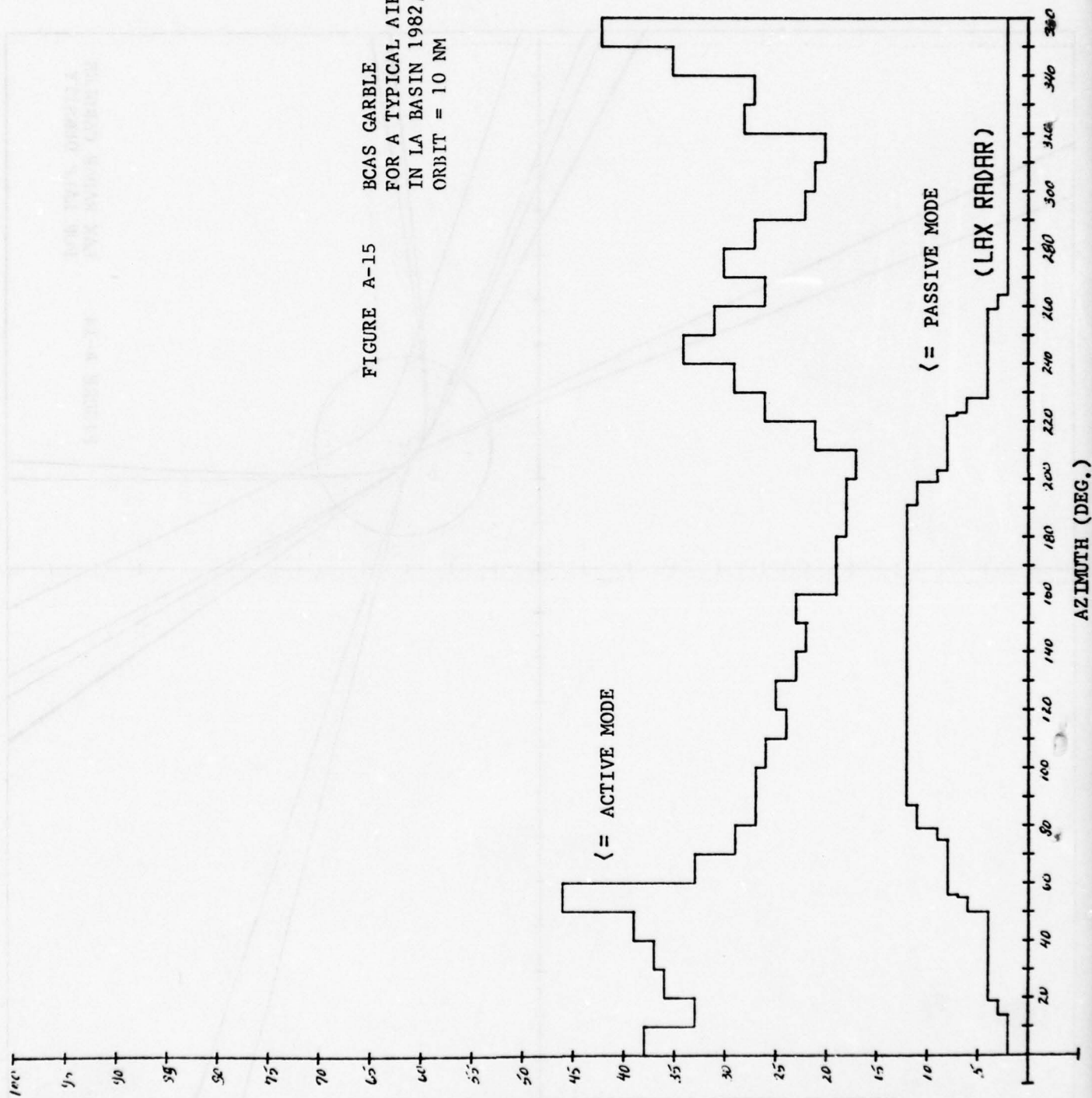


FIGURE A-15 BCAS GARBLE  
FOR A TYPICAL AIRCRAFT (399)  
IN LA BASIN 1982/5 MODEL (1/2 DENSITY)  
ORBIT = 10 NM



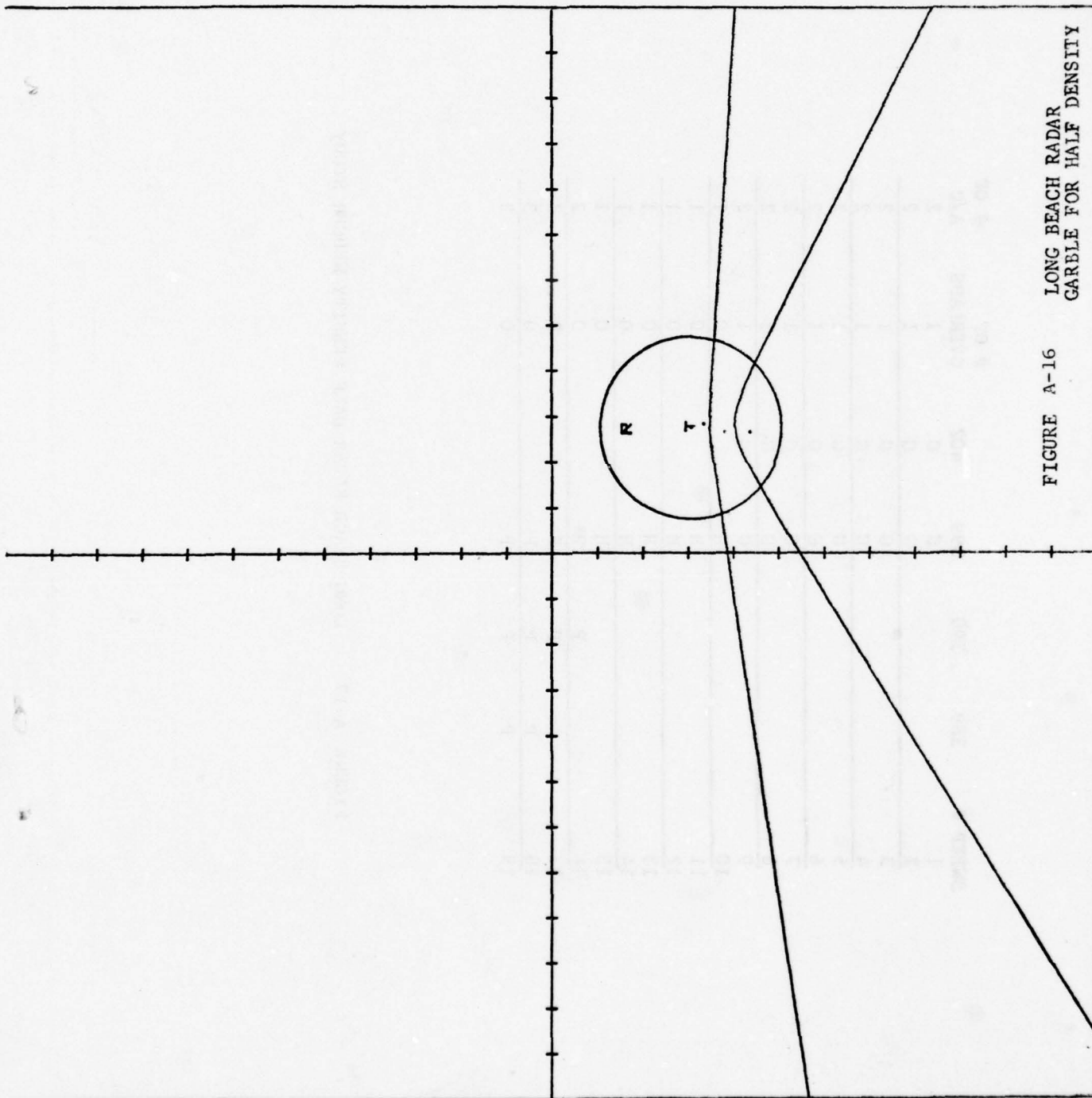


FIGURE A-16 LONG BEACH RADAR  
GARBLE FOR HALF DENSITY



SWEEP #	389	390	399	402	# OF OVERLAPS	# OF A/C
1			G	G	1	2
2			G	G	1	2
3			G	G	1	2
4			G	G	1	2
5			G	G	1	2
6			G	G	1	2
7			G	G	1	2
8			G	G	1	2
9			G	G	1	2
10			H		0	1
11			H		0	1
12			H		0	1
13			H		0	1
14			H		0	1
15			H		0	1
16		P	P		0	2
17		P	P		0	2
18	P	P	P		0	3
19	P	P	P		0	3

FIGURE A-17 LONG BEACH RADAR HALF DENSITY WEDGER STUDY



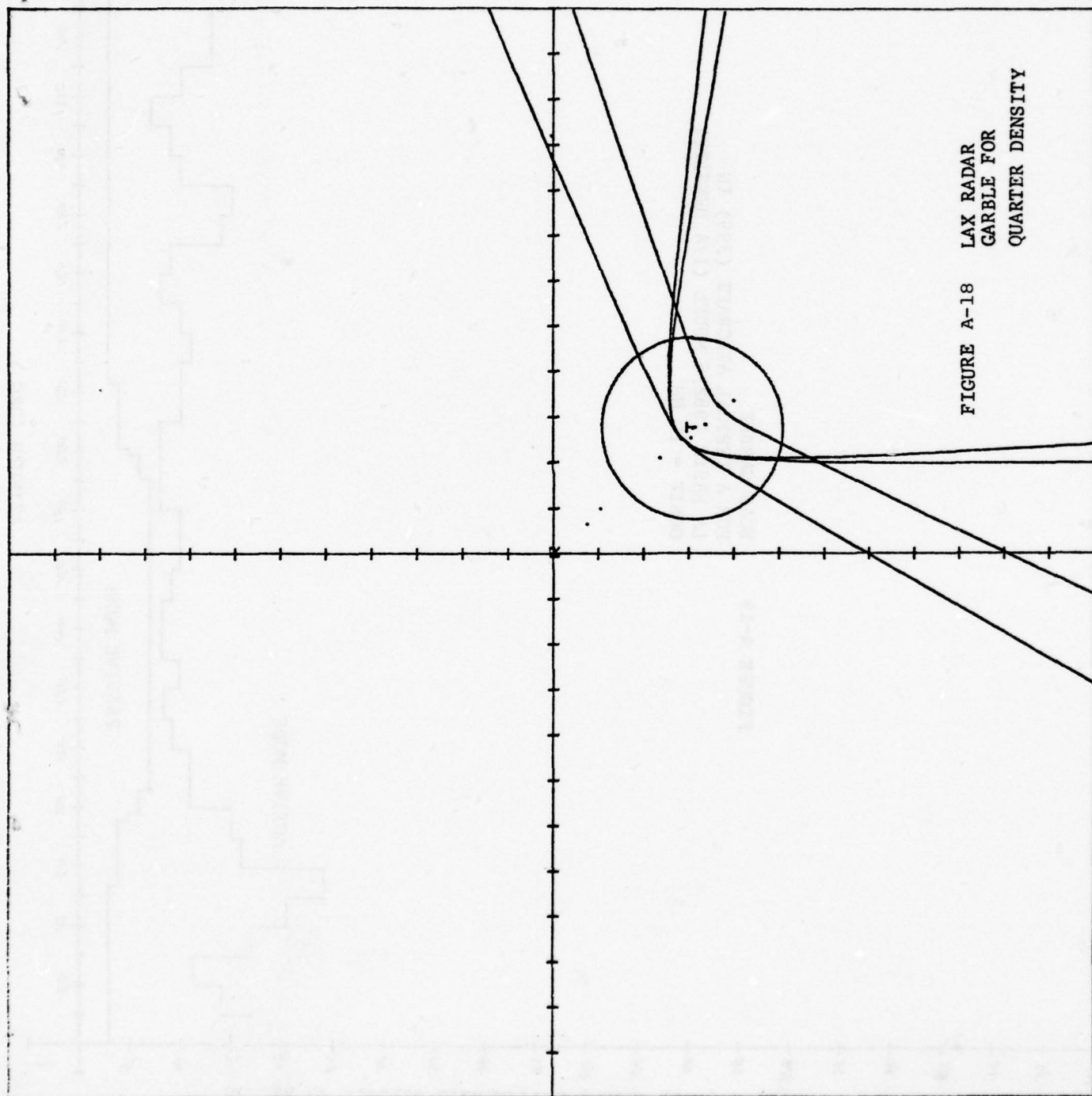
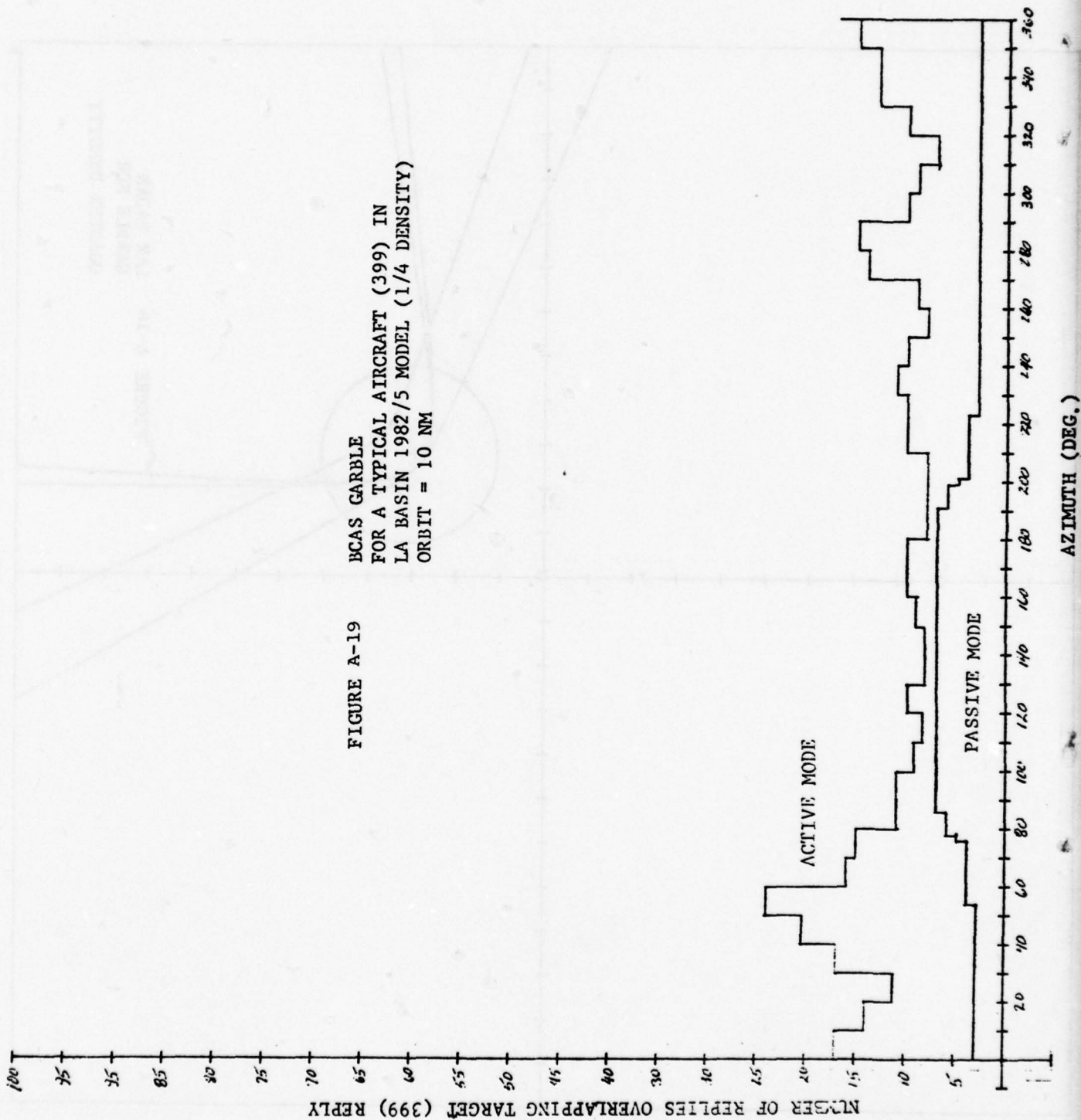


FIGURE A-18  
LAX RADAR  
GARBLE FOR  
QUARTER DENSITY



FIGURE A-19  
BCAS CARBLE  
FOR A TYPICAL AIRCRAFT (399) IN  
LA BASIN 1982/5 MODEL (1/4 DENSITY)  
ORBIT = 10 NM





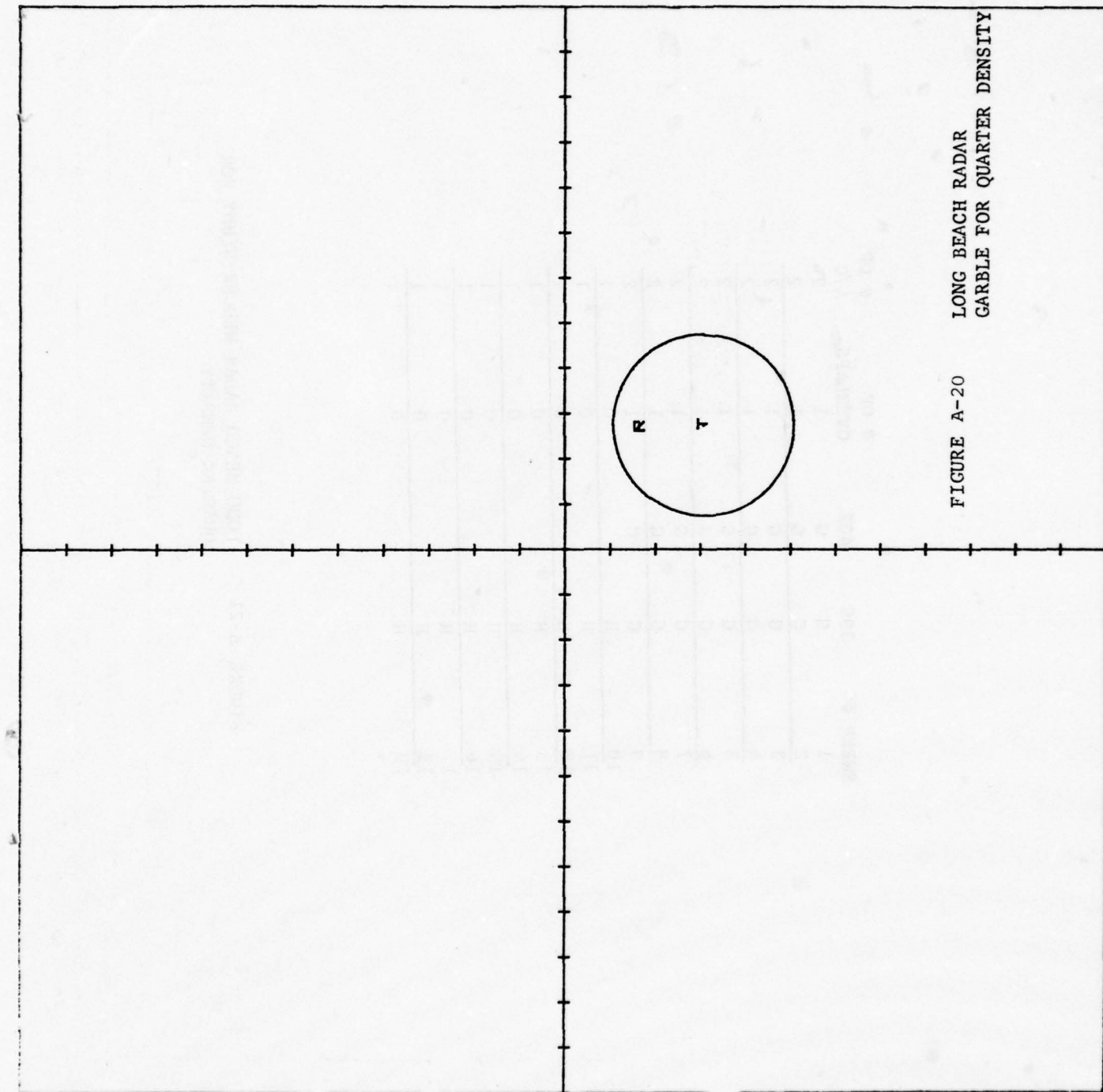


FIGURE A-20  
LONG BEACH RADAR  
GARBLE FOR QUARTER DENSITY



SWEEP #	399	402	# OF OVERLAPS	# OF A/C
1	G	G	1	2
2	G	G	1	2
3	G	G	1	2
4	G	G	1	2
5	G	G	1	2
6	G	G	1	2
7	G	G	1	2
8	G	G	1	2
9	G	G	1	2
10	H	G	1	2
11	H		0	1
12	H		0	1
13	H		0	1
14	H		0	1
15	H		0	1
16	H		0	1
17	H		0	1
18	H		0	1
19	H		0	1

FIGURE A-21  
LONG BEACH RADAR WEDGER STUDY FOR  
QUARTER DENSITY



error in azimuth now exists. This can cause threat range errors of up to 0.5 nm and bearing errors of 1.1 degrees.

A comparison of the three levels of passive garble for the three model densities is shown in Figure A-22, indicating how the traffic varies with azimuth from aircraft #399.

#### A.7 STATIC GARBLE ANALYSIS SUMMARY

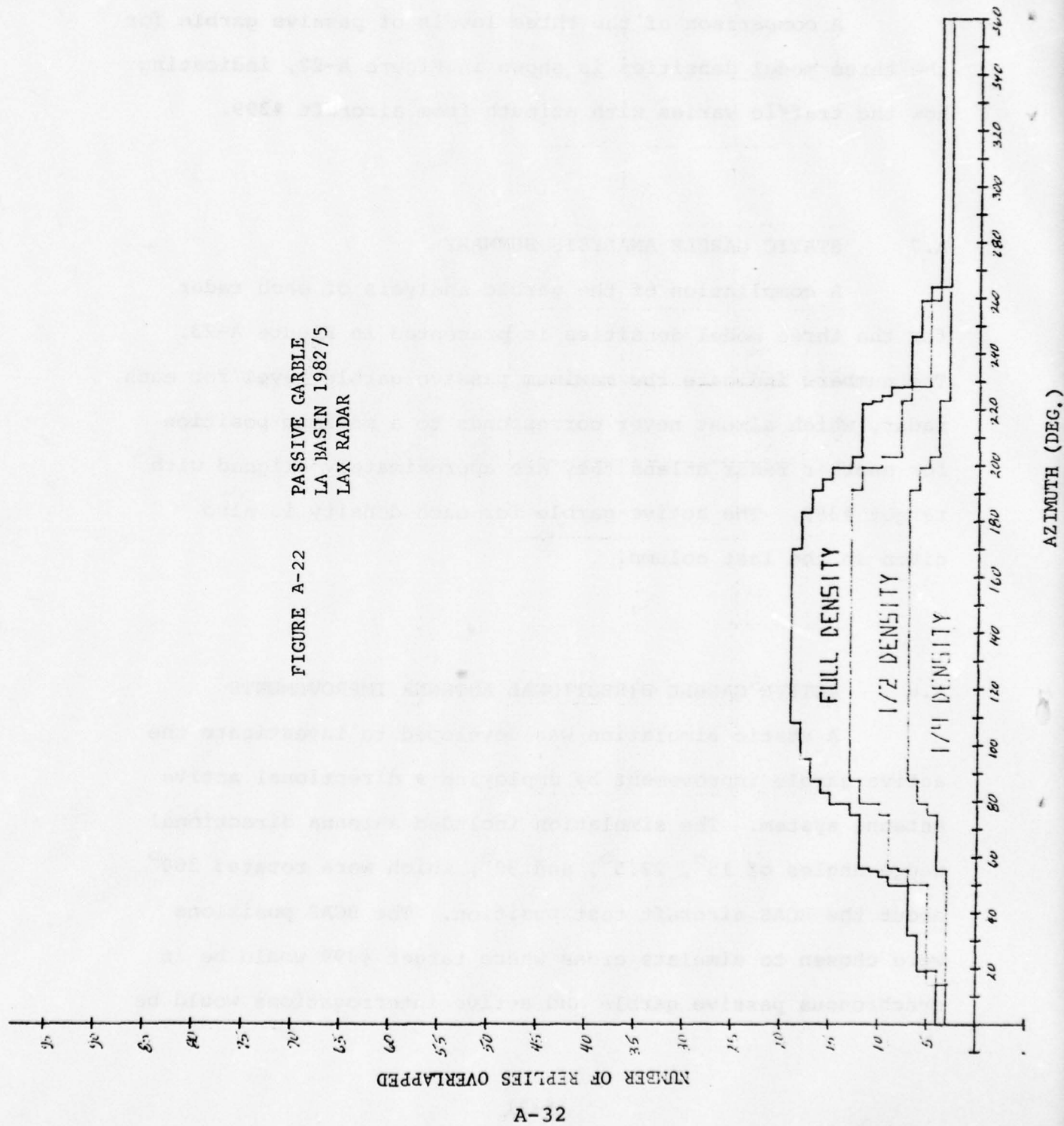
A compilation of the garble analysis of each radar for the three model densities is presented in Figure A-23. The numbers indicate the maximum passive garble level for each radar, which almost never corresponds to a maximum position for another radar unless they are approximately aligned with target #399. The active garble for each density is also given in the last column.

#### A.8 ACTIVE GARBLE DIRECTIONAL ANTENNA IMPROVEMENTS

A static simulation was developed to investigate the active garble improvement by employing a directional active antenna system. The simulation included antenna directional wedge angles of  $15^{\circ}$ ,  $22.5^{\circ}$ , and  $30^{\circ}$ , which were rotated  $360^{\circ}$  about the BCAS aircraft test position. The BCAS positions were chosen to simulate areas where target #399 would be in synchronous passive garble and active interrogations would be



FIGURE A-22  
 PASSIVE GARBLE  
 LA BASIN 1982/5  
 LAX RADAR





GARBLES											
	LAX	MAR	BUR	LGB	ONT	ELT	NOR	SP	SA	<u>PASSIVE*</u>	<u>ACT</u>
FULL	20	34	36	6	22	21	45	13	13	22	83
HALF	13	17	20	3	11	8	27	8	8	13	46
QUARTER	7	6	11	1	5	5	11	5	4	6	17

\*allows use of six radars

FIGURE A-23 GARBLE ANALYSIS SUMMARY



necessary to augment tracking data. This meant placing the BCAS on the opposite side of target #399 from the selected radars. Figure A-24 summarizes the statistics of the directional improvement over the omni antenna for the three model densities. Figure A-25 shows the specific wedges of the directional scan and BCAS position which includes both target #399 and the radar in a passive garble geometry.

#### A.9 DYNAMIC, THREE-DIMENSIONAL SIMULATION

In order to verify the validity of some of the assumptions made in the formulation of the static, two-dimensional simulations, and to allow detailed investigation of some of the more complex garble phenomena, a dynamic, three-dimensional simulation was developed in Fortran IV for a CDC Cyber 175 Computer. The program accepts as input a complete description of the interrogator-aircraft environment that it is to reproduce. Interrogator characteristics specified for the simulation include latitude, longitude, scan (rotation) rate, interrogation repetition rate (including a provision for six-interval and eight-interval staggered interrogation rates), and interrogation beamwidth (assumed to be  $4^{\circ}$  for purposes of the simulations whose description follows). Although the garble simulations concentrated on the use of a single interrogator at one time, some studies of fruit incorporated 70 ground sites simultaneously—all within 290 nm of LAX. Data



1982 MODEL					1/2 DENSITY			1/4 DENSITY				
	Max	Min	Avg	1σ	Max	Min	Avg	1σ	Max	Min	Avg	1σ
W E D G E	13	0	3.22	2.49	9	0	1.58	1.61	3	0	.67	.77
22.5°	16	0	4.86	3.31	10	0	2.40	2.07	3	0	1.03	.95
A N G L E	18	1	6.43	4.01	11	0	3.18	2.48	4	0	1.33	1.10
30°	77	-	-	-	38	-	-	-	16	-	-	-
OMNI												

Figure A-24 Active Directional Antenna Garble Statistics (Static Model)



1982 MODEL

		WEDGE ANGLE			
		<u>15°</u>	<u>22.5°</u>	<u>30°</u>	<u>OMNI</u>
R A D A R	LAX	9	11	14	77
	LGB	6	10	12	77

Figure A-25 Active Directional Antenna Wedge Garble Toward Radar (Static Model)



regarding interrogator characteristics were obtained from the file maintained by the Frequency Assignment Staff in FAA's Airways Facilities Service. These characteristics are shown in the program output listings included in Attachment 2.

Aircraft deployment made use of the same snapshot of the Los Angeles Basin model used for the static, two-dimensional simulations. The entire group of 743 aircraft was processed by the simulation. In addition to x- and y-coordinates of position, aircraft altitude, climb rate, and horizontal velocity were provided to and processed by the program. The "dynamic" nature of the program is due to its ability to account for aircraft motion (including that of the BCAS aircraft) as well as for rotation of the interrogators. Turn rates specified in the Los Angeles Basin model are ignored; instead, the aircraft are moved in straight lines according to the horizontal velocity components specified in the model. All aircraft are assumed to be equipped with a transponder that radiates at a particular power level (nominally 500 watts at the antenna end of the transmission line) and with a specified reply probability. To minimize the execution time of the program, a parameter is required to specify the interval at which aircraft positions are updated. BCAS aircraft position and velocity in three dimensions are specified in a similar manner.



The dynamic simulation uses a basic "frame time" of 2.5 ms within which to compute the various interrogator-aircraft interactions. The simulation begins with a random selection of interrogator azimuths and interrogation pulse start times. Thereafter, the azimuth and interrogation time are propagated according to the rate specified in the input file. Any interrogation that occurs during a current time frame may elicit a reply during either the current frame or the subsequent frame. Most of the simulation program logic is concerned with the bookkeeping tasks associated with accounting for the interrogations and replies as they occur in separate time frames.

For simulations of garble phenomena, two windows are computed. Both involve a protection distance which, although parametric within the program, has been assumed to be 20 nm in the computer runs made to date. First, an azimuth window is established to ensure proximity among BCAS, target aircraft, and the main beam of the interrogator eliciting replies from the target. The azimuth window is opened with respect to a particular interrogator when the boresight of the main beam is separated from the line of sight to the BCAS aircraft by no more than the angle  $\theta$ , where

$$\theta = \tan^{-1} \left( \frac{d_p}{\rho_{IB}} \right) + \frac{\gamma}{2}$$



In this equation,

$d_p$  = the protection distance (20 nm)

$\rho_{IB}$  = the projection of the vector from  
the interrogator of interest to the  
BCAS aircraft in the horizontal  
plane

$\gamma$  = interrogator beam width

Having established an azimuth window, the program computes a time window within which replies from a target aircraft must fall if the aircraft is within the protection distance. The time window begins three microseconds (to account for transponder delay) after the interrogation from the ground site of interest arrives at the BCAS aircraft, and ends approximately 250 microseconds later, when the interrogation would have had time to travel past BCAS out to the extreme of the protection range and back again to BCAS—a distance of some 40 nm. An aircraft located at this extreme would have taken the longest time to be detected by BCAS, yet still be within the protected range.

Once the two windows are established, the program begins an iterative process of reply generation for all aircraft/interrogator interactions during the frame. If no interrogation occurs during the current frame, then no further action is required with regard to that particular interrogator during the frame. Otherwise, the interrogation



time and interrogator azimuth are computed. Next, a test is made to see if each aircraft is located within the main beam of the interrogator of interest. If it is not, processing continues with the next aircraft; if the aircraft is within the main beam, another test is performed to ensure that the aircraft is visible above the radar horizon. Although the aircraft movement geometry is executed for a flat earth, the equivalent radar horizon calculation is made assuming a spherical earth with four-thirds its actual radius. Finally, a random number generator is employed in conjunction with the reply probability parameter supplied as input to the program in order to determine if a reply will be generated. Once the reply probability test is passed, a reply is generated, and its arrival time and power at BCAS stored in an array for subsequent processing.

This iterative process continues until all replies have been generated (in no particular time order) and stored in a reply array. At the end of the frame, the reply array is ordered chronologically and made available for printing or subsequent processing. The incorporation of reply pulse arrival time and power, as well as the inclusion of aircraft and interrogator numbers associated with each reply, makes further detailed analysis of garble and reply processing a straightforward task. Aircraft identification, for example, will allow altitude information pulses to be generated when



specific degarblers and reply processors are ready to be evaluated. Even the effects of pulse stretching and phase cancellation can be analyzed in detail with such a model. These phenomena are the subjects of continuing investigations.

#### A.10 RESULTS OF THE DYNAMIC SIMULATION

The dynamic simulation has been used to validate some of the data obtained in the two-dimensional static simulations. By placing the BCAS aircraft at a location 10 nm south of aircraft #399, for example, the peak number of garbled replies was found to correlate with the static model to within 13%. Within the windows for the Norton AFB radar, 39 garbled replies were found in the three-dimensional simulation versus 45 in the two-dimensional model. One reason for the smaller number in the three-dimensional simulation is the fact that several aircraft were too low to be interrogated by the Norton radar, although they were within the protected range of the BCAS. The two models can thus be reconciled despite only minor differences.

Fruit counts obtained for the entire environment of 70 interrogators and 743 aircraft also correlate well with both measurements and predictions of interrogations and replies reported previously. Fruit averaged 62,500 replies per second and peaked at 84,000 per second over the period



measured. The lowest rate detected during the period was 44,000 replies per second.

Perhaps the most important results obtained to date with the three-dimensional simulation will allow important decisions to be made regarding radar selection and mode selection logic. These results indicate the average and maximum number of garbled replies detected on a complete scan of the nine radars of primary interest within the basin. The BCAS aircraft was placed at 10-nm intervals along radials extending north, east, south, and west from LAX. At each position of the BCAS aircraft, the number of garbled replies was determined for each sweep of the radar (each time window) within its azimuth window. The extreme values and the average over all sweeps were recorded. One garble is caused by two overlapping replies; two garbles by three overlapping replies; and so on. A single reply, of course, is ungarbled. No reply during a sweep was not included in the average. The minimum number of garbles in every case except one was zero; that is, in nearly every geometry, including the very worst, there was at least one sweep in which some reply arrived in the clear. The lone exception had a single garble as its minimum. The complete results are presented in Figures A-26 through A-29.

Similar runs were made for the operational  $068^{\circ}$  approach to LAX and for the southern departure at  $120^{\circ}$ . These results are presented in Figures A-30 and A-31.



RADAR	DISTANCE (NM) FROM LAX ALONG NORTH RADIAL					
	10	20	30	40	50	60
LAX	.8/9	1.7/11	2.7/11	3.7/12	4.9/14	6.1/19
Burbank	.8/5	.2/2	.3/3	.7/4	1.0/6	1.5/8
El Toro	9.2/24	9.8/25	10.7/24	10.6/26	11.6/27	11.8/25
Long Beach	2.3/9	3.1/15	4.5/17	4.9/17	6.5/18	7.6/18
March	11.9/55	9.7/54	6.6/43	4.2/13	4.0/11	3.9/11
Norton	7.9/41	5.6/30	2.7/17	2.5/10	3.0/10	2.9/10
Ontario	5.6/25	4.1/20	2.3/15	1.8/9	2.3/9	2.4/9
San Pedro	2.6/13	5.2/19	7.1/20	9.0/21	10.9/22	12.7/23
Santa Ana	6.3/21	7.2/24	8.4/23	8.8/23	10.1/23	10.8/21

Figure A-26 Average/Peak Garble for North Radial from LAX



RADAR	DISTANCE (NM) FROM LAX ALONG EAST RADIAL					
	10	20	30	40	50	60
LAX	1.3/7	2.1/9	4.2/18	7.9/23	12.6/28	15.8/32
Burbank	2.3/9	2.6/13	3.4/15	6.0/26	9.1/30	10.6/33
El Toro	4.6/14	2.6/10	1.6/8	1.5/9	1.6/11	2.0/14
Long Beach	1.2/11	1.2/10	2.0/11	3.9/16	7.0/25	9.1/25
March	9.0/34	5.6/22	2.9/14	1.5/11	.6/6	.0/0
Norton	7.8/34	5.2/28	2.7/15	1.8/12	.9/9	.6/9
Ontario	4.0/17	2.6/14	1.2/8	.8/7	.7/3	1.1/3
San Pedro	1.7/10	2.3/11	4.1/14	7.6/26	12.7/39	15.9/39
Santa Ana	3.2/10	2.0/8	1.8/9	1.7/12	2.4/17	3.2/18

Figure A-27 Average/Peak Garble for East Radial from LAX



RADAR	DISTANCE (NM) FROM LAX ALONG SOUTH RADIAL					
	10	20	30	40	50	60
LAX	1.0/9	1.8/11	2.3/12	3.1/12	3.2/12	3.5/12
Burbank	3.2/15	6.1/22	8.8/22	11.5/27	11.5/23	11.7/23
El Toro	8.0/25	6.4/25	4.4/18	2.5/10	1.1/7	.6/2
Long Beach	1.5/8	2.1/8	2.8/7	3.3/9	3.7/9	3.9/9
March	15.6/33	16.1/33	14.1/32	10.4/30	6.1/25	3.2/9
Norton	16.1/39	19.3/37	19.7/38	19.2/37	16.3/37	12.3/33
Ontario	10.5/24	13.4/27	16.6/27	16.4/29	15.1/29	13.7/28
San Pedro	.5/6	.3/2	.3/2	.7/3	.8/3	.7/3
Santa Ana	5.2/15	4.3/16	3.5/13	2.8/13	2.0/13	1.4/7

Figure A-28 Average/Peak Garble for South Radial from LAX



RADAR	DISTANCE (NM) FROM LAX ALONG WEST RADIAL					
	10	20	30	40	50	60
LAX	3.0/7	2.6/7	1.7/7	1.1/5	.6/4	.4/3
Burbank	4.3/11	3.8/11	2.9/10	2.0/7	1.5/8	1.6/9
El Toro	19.7/35	18.7/35	18.0/32	16.7/28	14.5/26	12.3/25
Long Beach	6.0/17	5.4/17	4.5/15	3.9/11	3.2/10	2.9/11
March	34.0/56	34.0/62	33.6/69	31.4/67	26.7/63	21.5/53
Norton	32.0/57	30.4/56	28.3/56	25.1/56	21.3/55	17.0/52
Ontario	26.4/38	24.9/38	22.4/36	19.6/36	16.3/36	12.8/34
San Pedro	1.5/8	1.5/7	1.1/7	.7/5	1.0/12	1.4/12
Santa Ana	14.3/29	13.5/29	12.4/26	11.6/22	9.7/21	8.2/18

Figure A-29 Average/Peak Garble for West Radial from LAX



DISTANCE (NM) FROM LAX ALONG 068° RADIAL						
RADAR	10	20	30	40	50	60
LAX	1.2/7	2.0/10	3.8/19	5.3/23	6.9/25	8.6/27
Burbank	1.8/8	1.8/12	1.9/13	2.5/14	1.9/13	1.3/6
El Toro	5.0/17	4.3/16	3.8/11	3.6/11	4.1/14	4.3/15
Long Beach	1.4/11	1.6/11	2.9/13	4.3/14	5.2/15	6.7/18
March	8.8/38	5.4/29	2.8/17	1.6/9	0.6/5	0.1/1
Norton	6.9/34	4.1/30	2.0/15	1.3/8	0.7/8	0.3/1
Ontario	3.7/18	2.3/14	0.9/7	0.3/6	0.0/1	0.1/1
San Pedro	1.9/11	2.9/15	5.2/20	7.7/22	10.4/25	12.9/35
Santa Ana	3.5/12	3.3/10	3.5/11	3.7/13	4.9/17	5.8/18

Figure A-30 Average/Peak Garble for 068° Radial from LAX



DISTANCE (NM) FROM LAX ALONG 120° RADIAL						
RADAR	10	20	30	40	50	60
LAX	1.5/9	2.8/11	5.4/20	9.9/21	13.2/26	15.1/29
Burbank	2.8/9	4.3/16	8.0/23	12.2/26	15.0/28	18.3/29
El Toro	4.7/16	2.2/9	1.1/7	0.2/3	0.2/2	0.2/1
Long Beach	1.0/7	0.8/9	1.5/8	2.7/9	4.0/14	4.8/16
March	10.4/28	6.3/22	3.4/15	1.5/9	0.9/8	0.4/2
Norton	10.2/34	8.3/28	5.5/22	3.2/17	1.8/13	0.5/3
Ontario	5.7/17	4.0/14	3.1/19	2.7/16	1.9/13	2.0/9
San Pedro	1.4/10	1.8/11	3.2/13	6.0/16	8.1/17	9.6/17
Santa Ana	3.2/13	1.5/8	0.7/6	0.2/2	0.4/4	0.7/4

Figure A-31 Average/Peak Garble for 120° Radial from LAX



FOR

FIGURE A-32

LA BASIN GARBLE DATA PLOT

(SEE DRAWINGS PACKET)

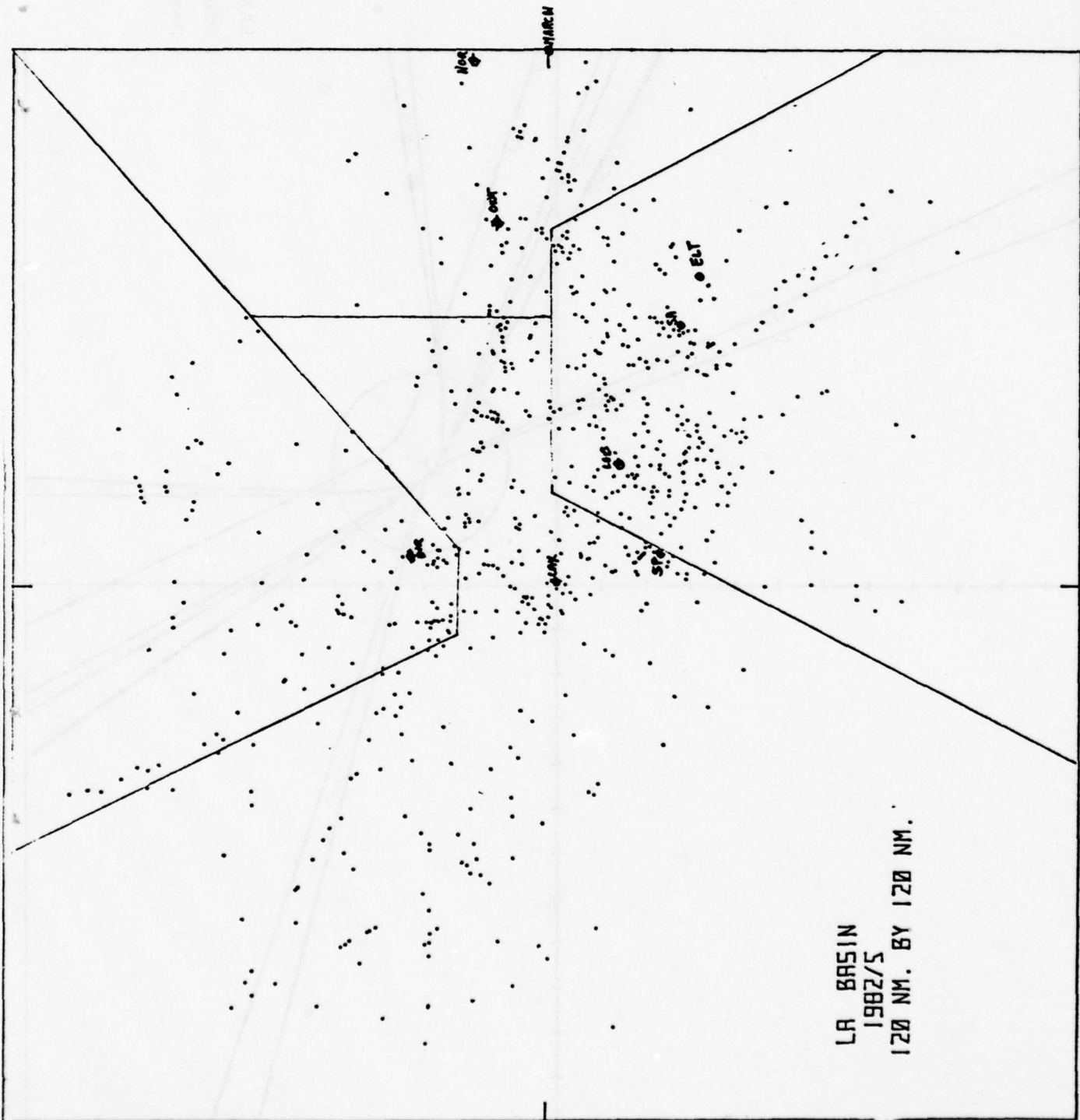


APPENDIX A

ATTACHMENT 1

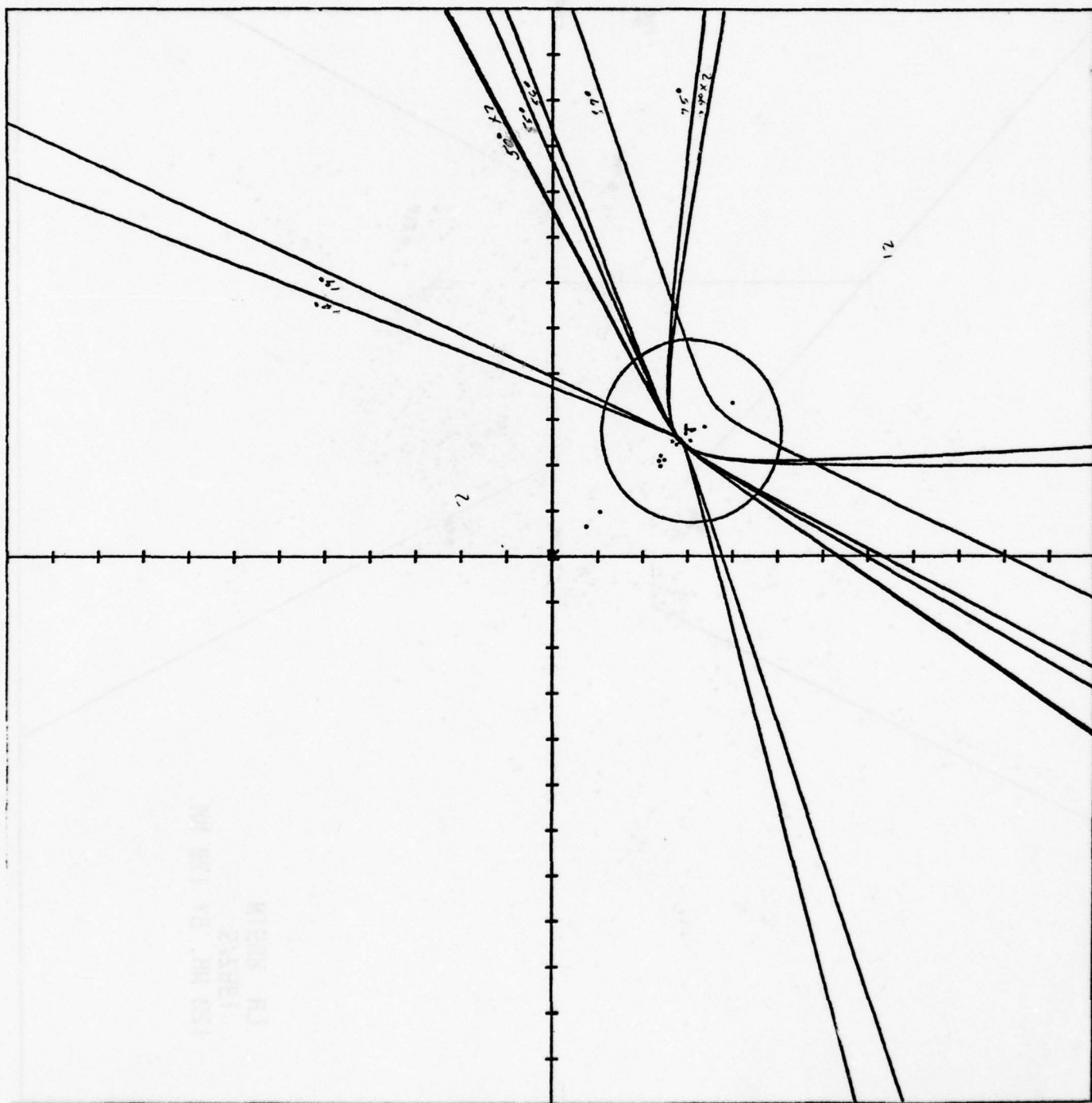
The following are passive garble contours for target #399 in the LA Basin plotted with respect to each of 9 radars for three Basin traffic densities.





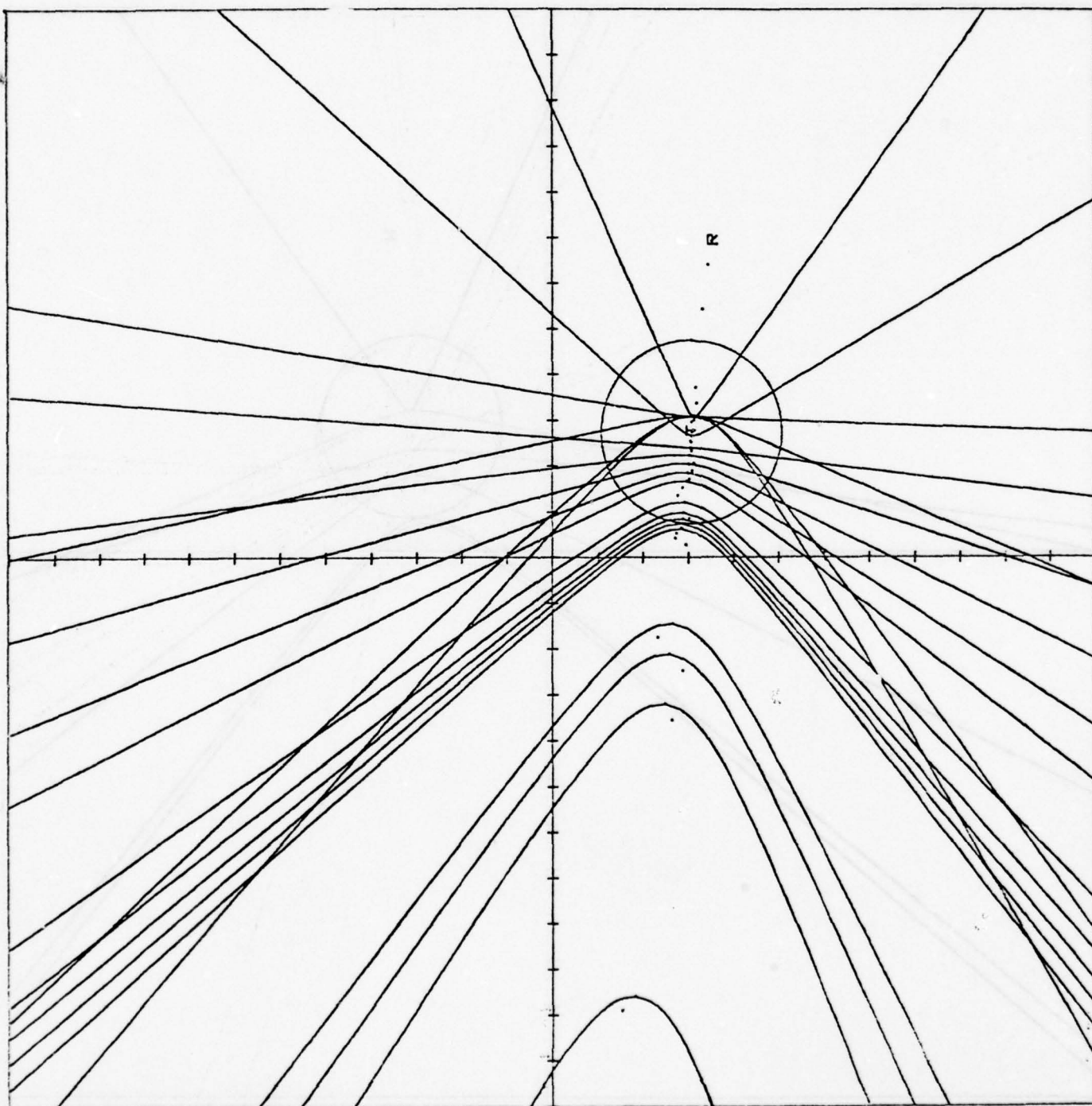


LAX Radar Garble  
Contours for Half  
Density



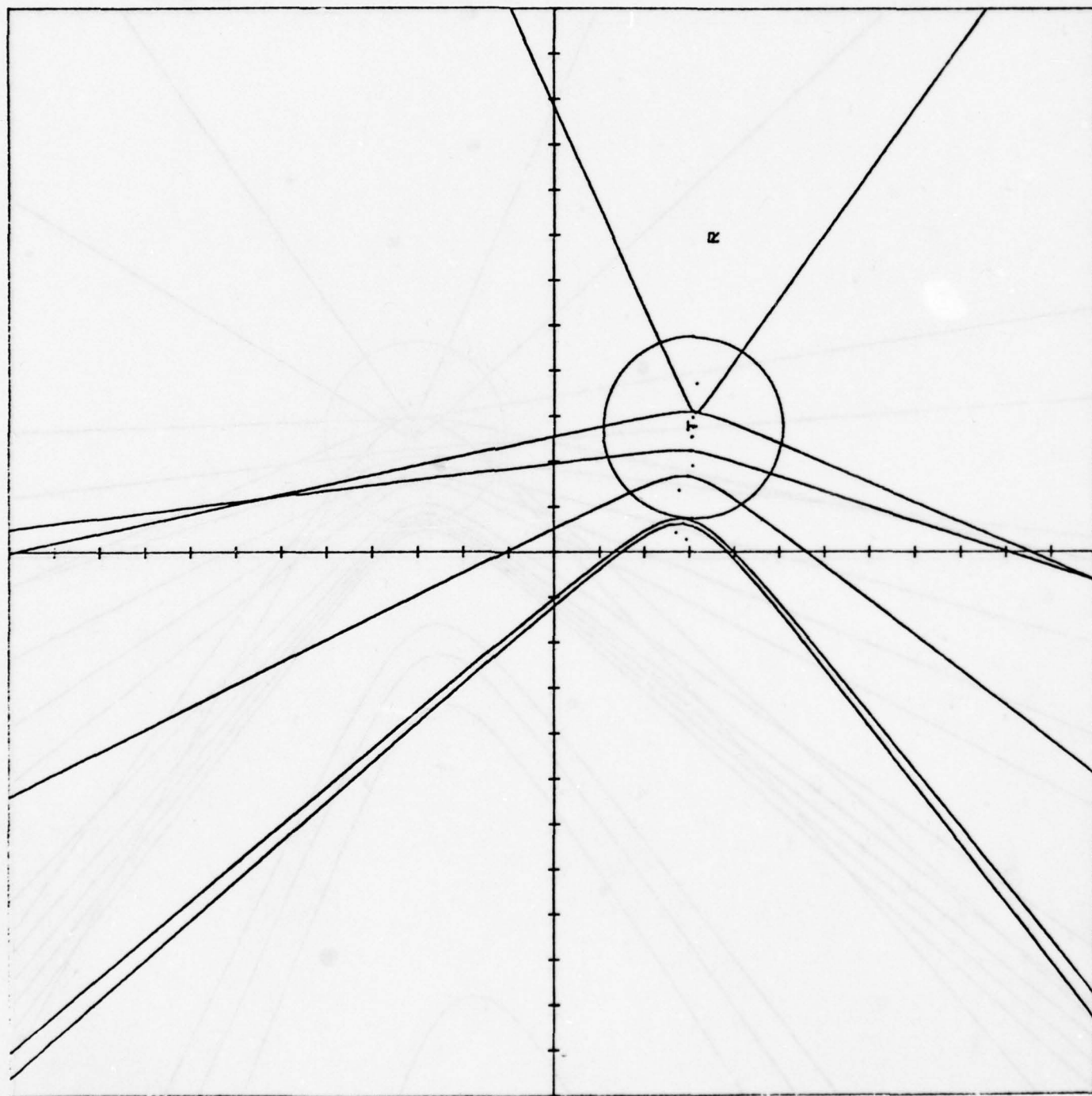


El Toro Radar  
Garble Contours  
for Full Density



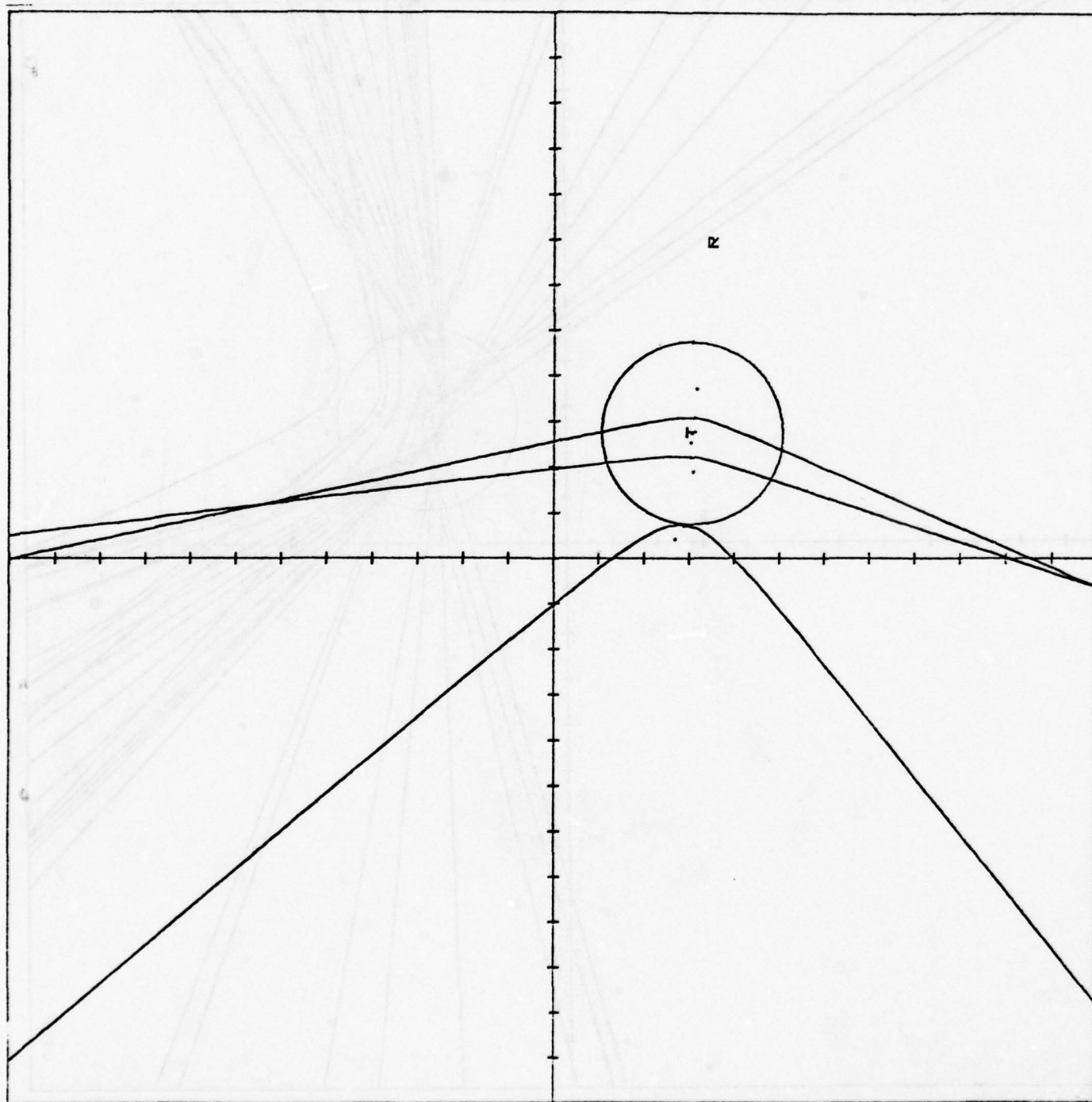


El Toro Radar  
Garble Contours  
for Half Density



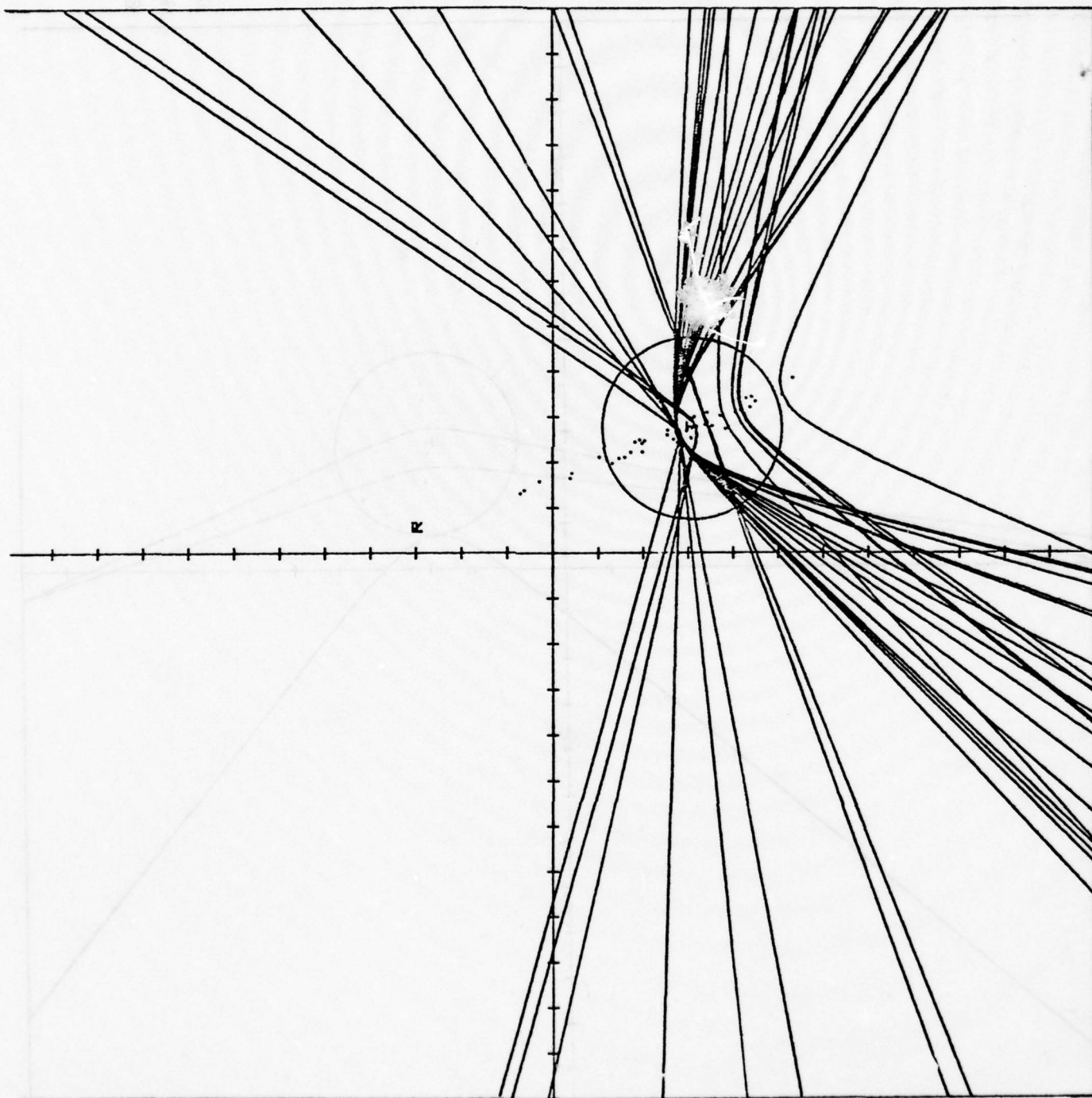


El Toro Radar  
Garble Contours  
for Quarter Density



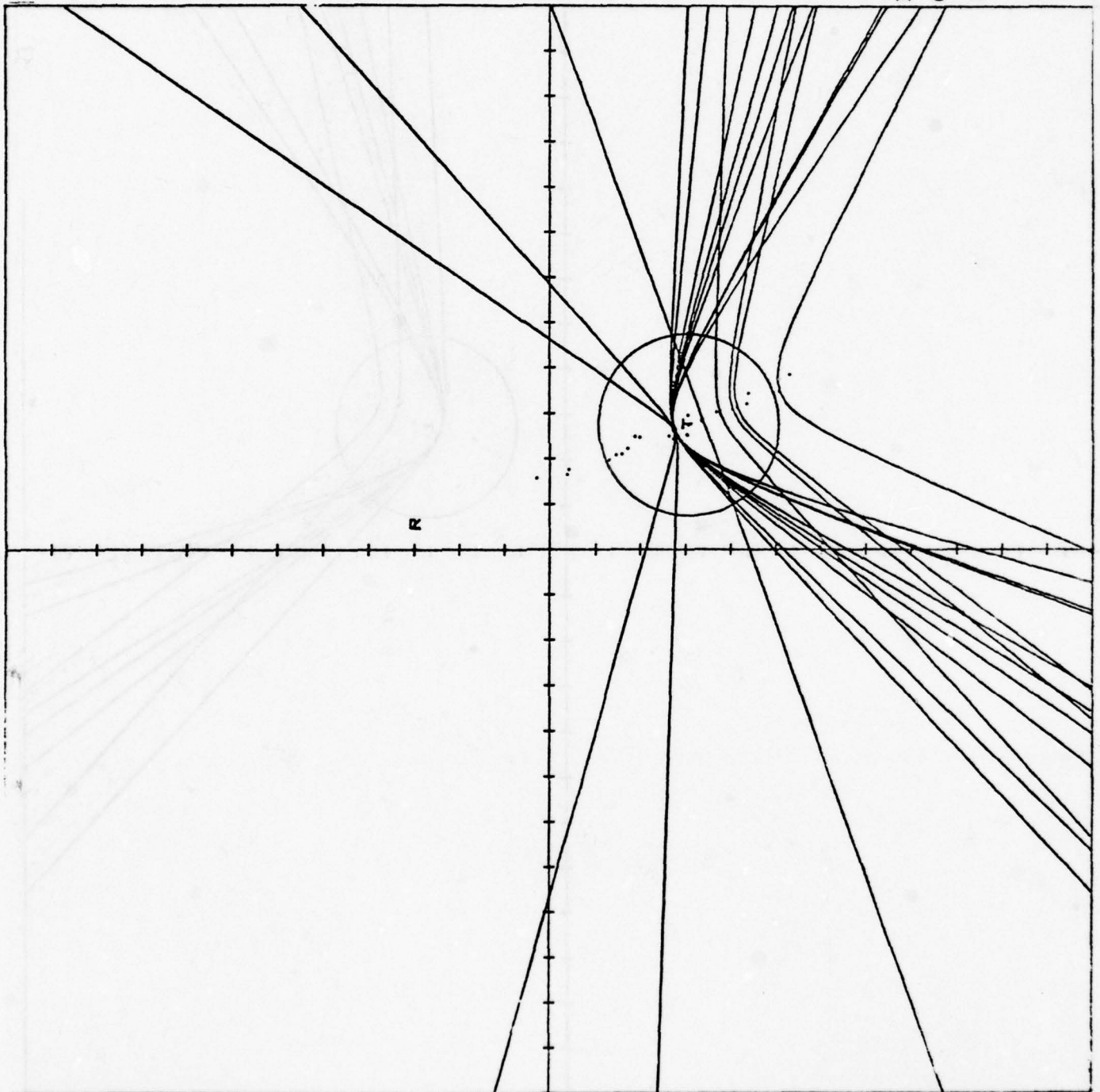


Burbank Radar  
Garble Contours  
for Full Density



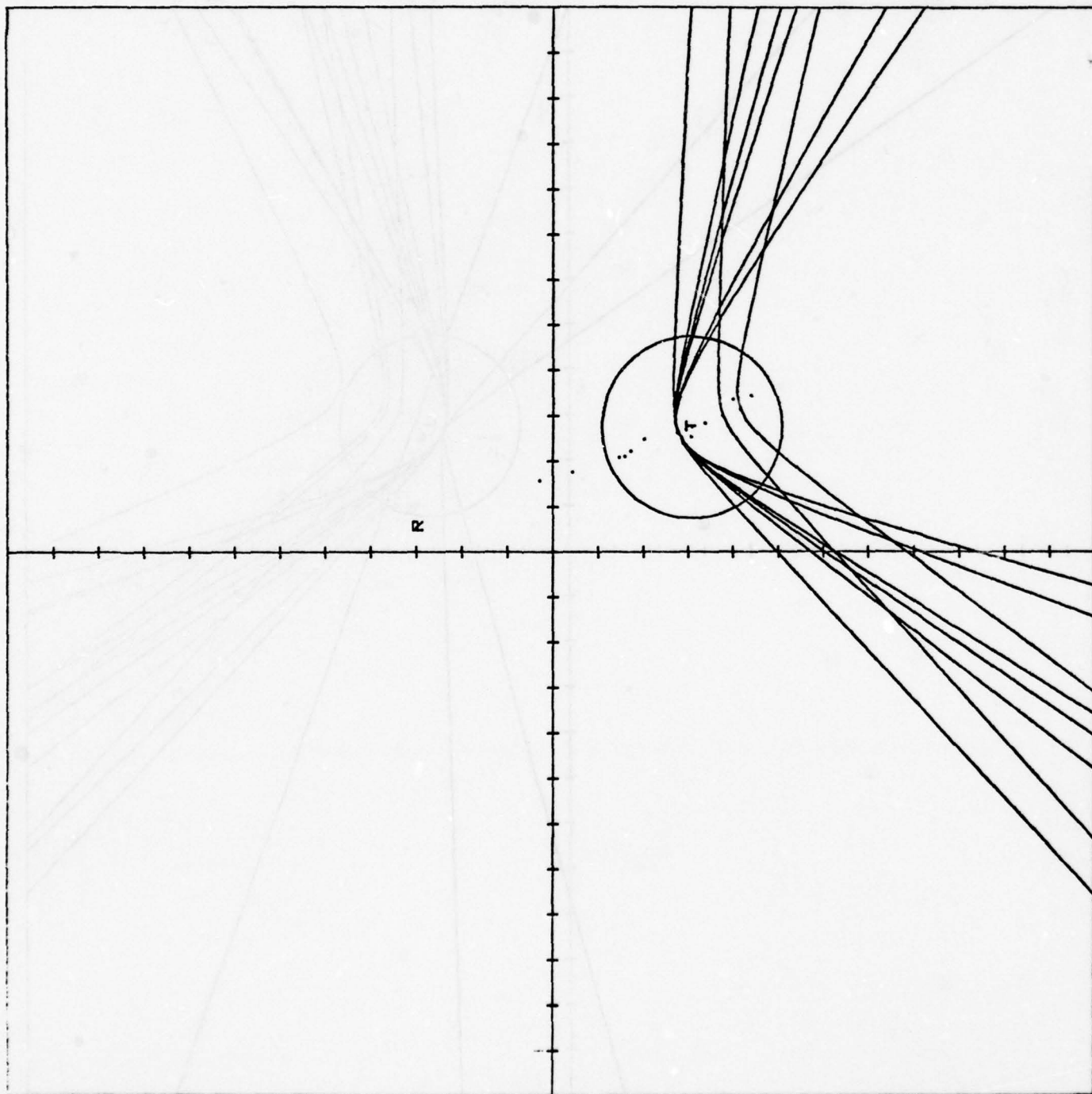


Burbank Radar  
Garble Contours  
for Half Density



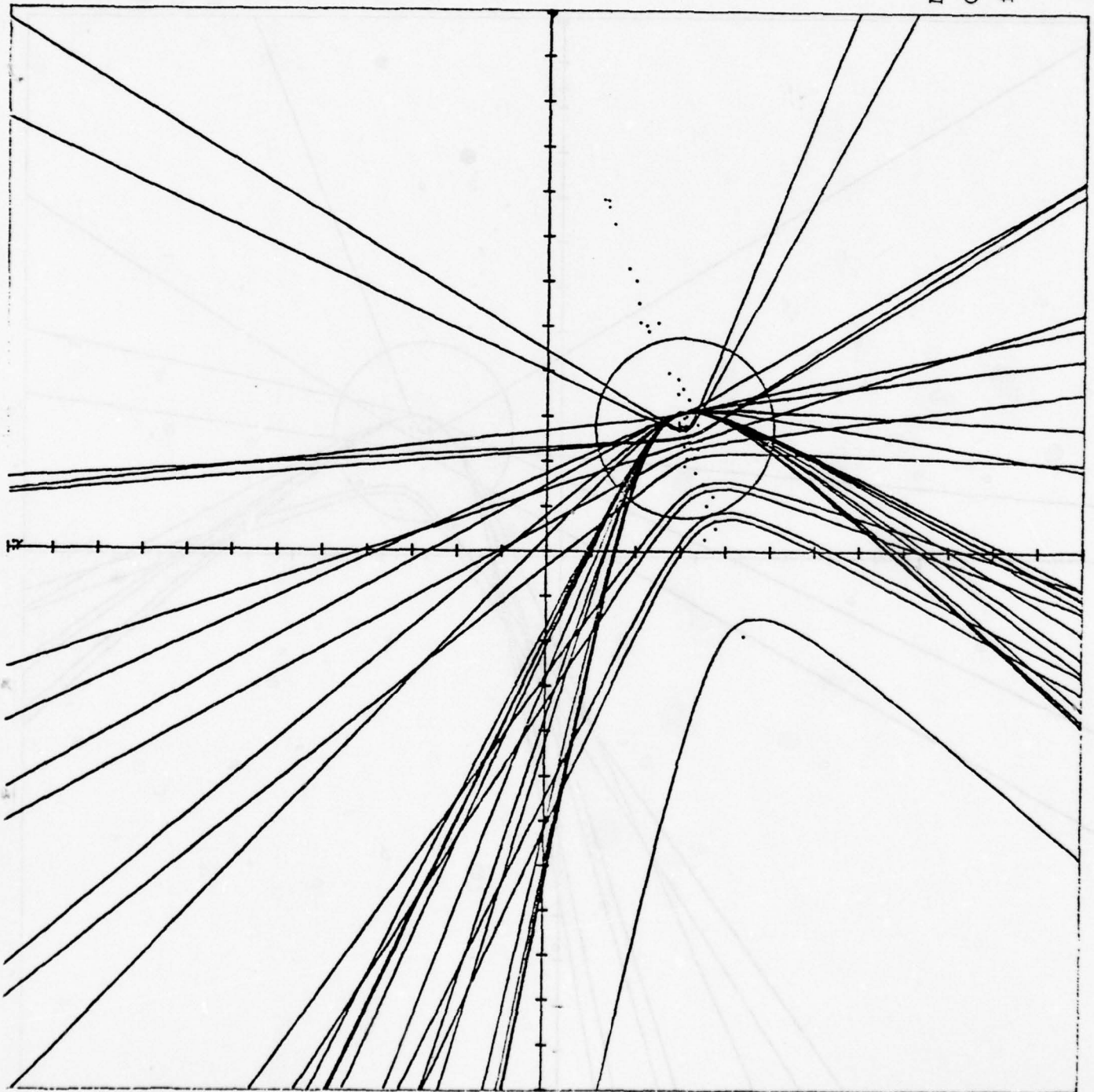


Burbank Radar  
Garble Contours  
for Quarter Density



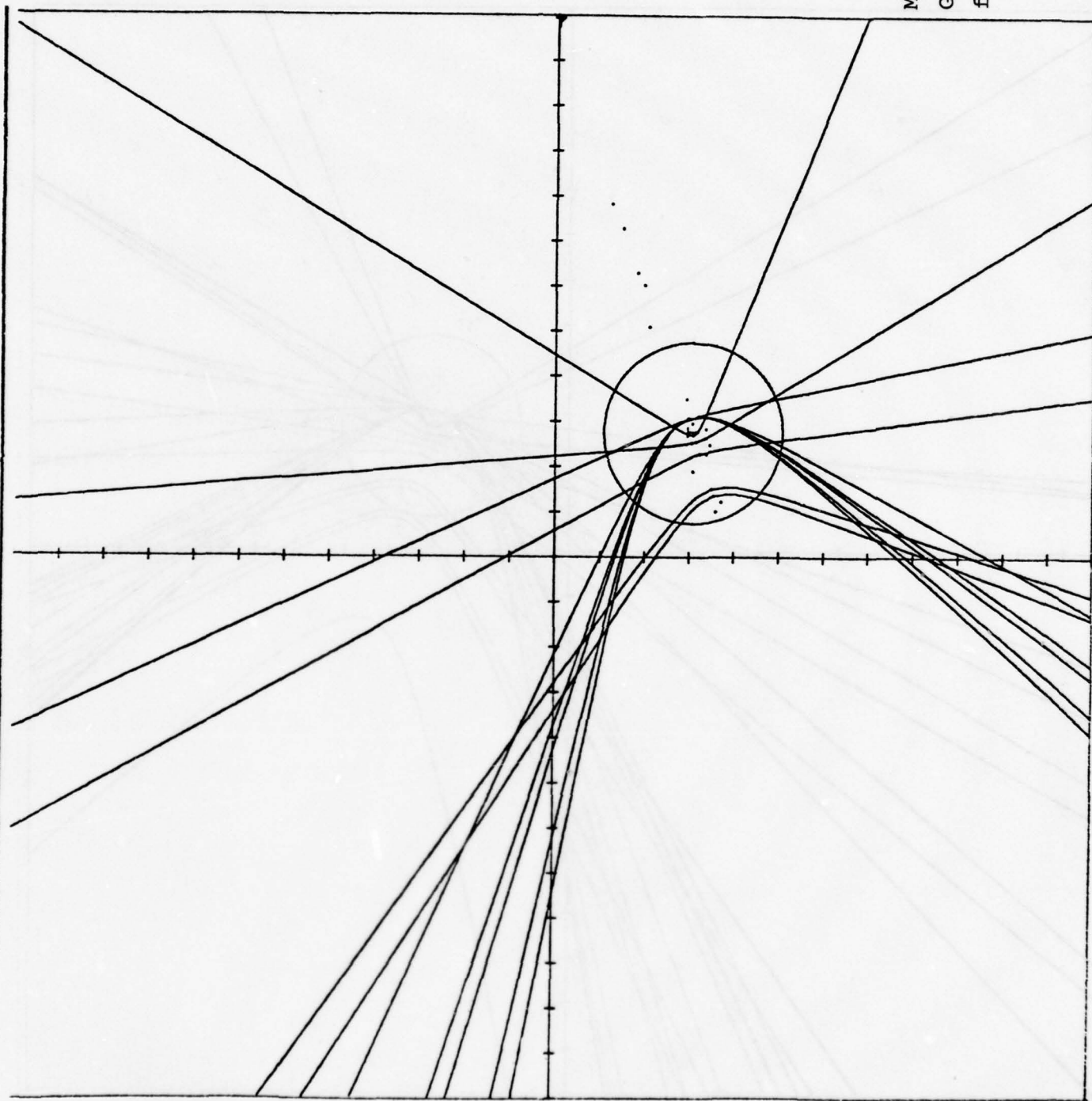


March Radar  
Garble Contours  
for Full Density





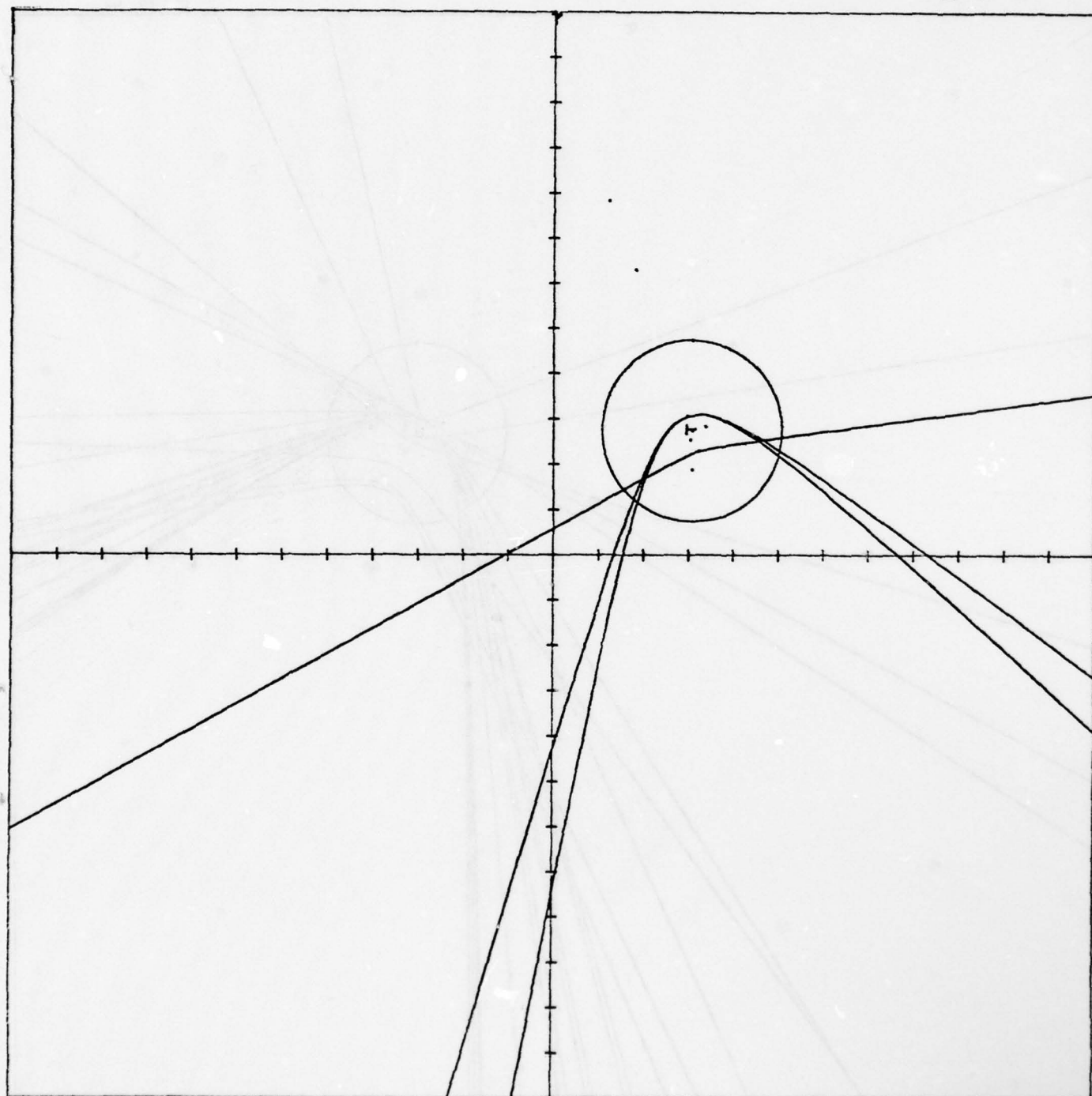
March Radar  
Garble Contours  
for Half Density



A-60

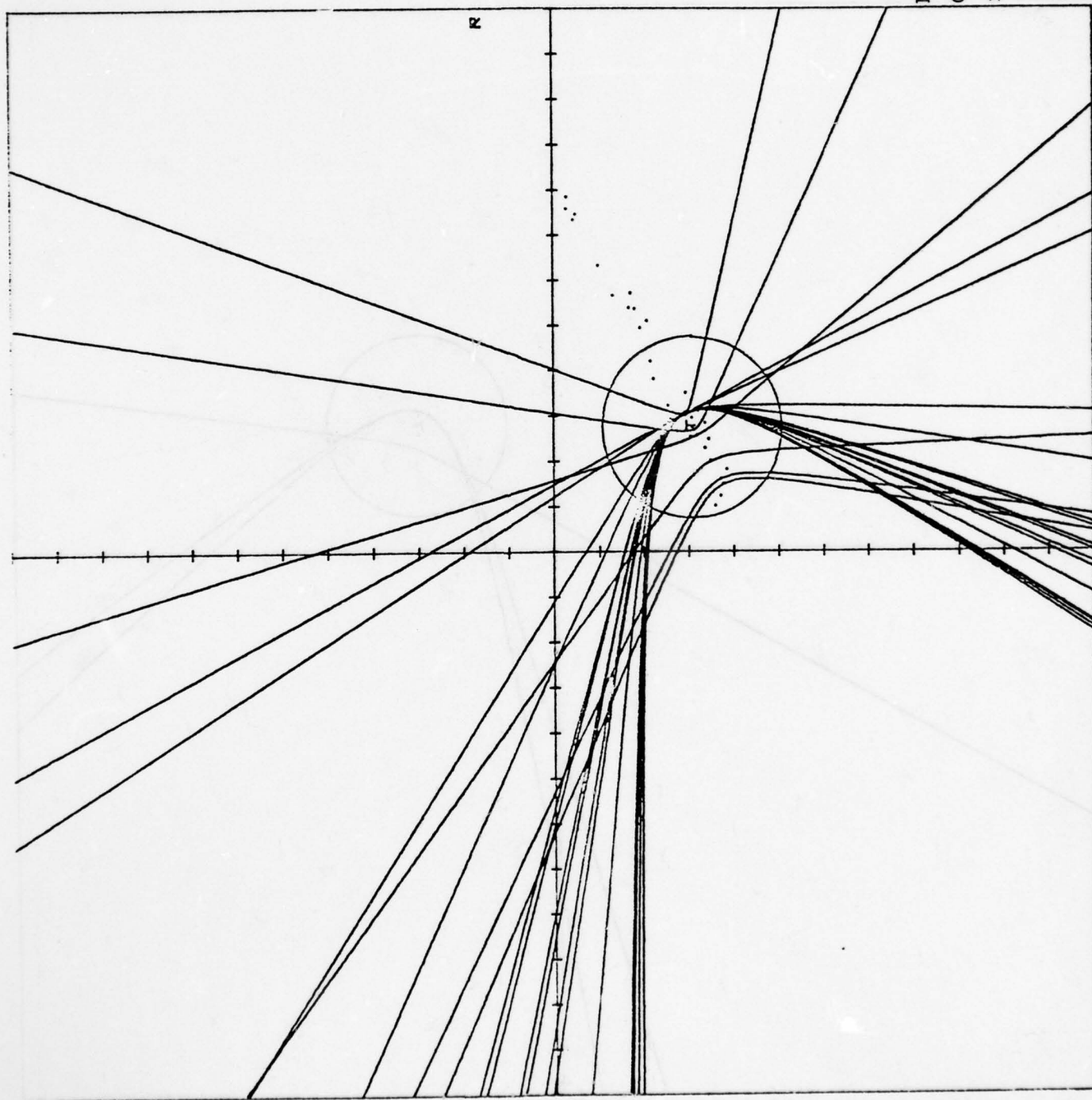


March Radar  
Garble Contours  
for Quarter Density





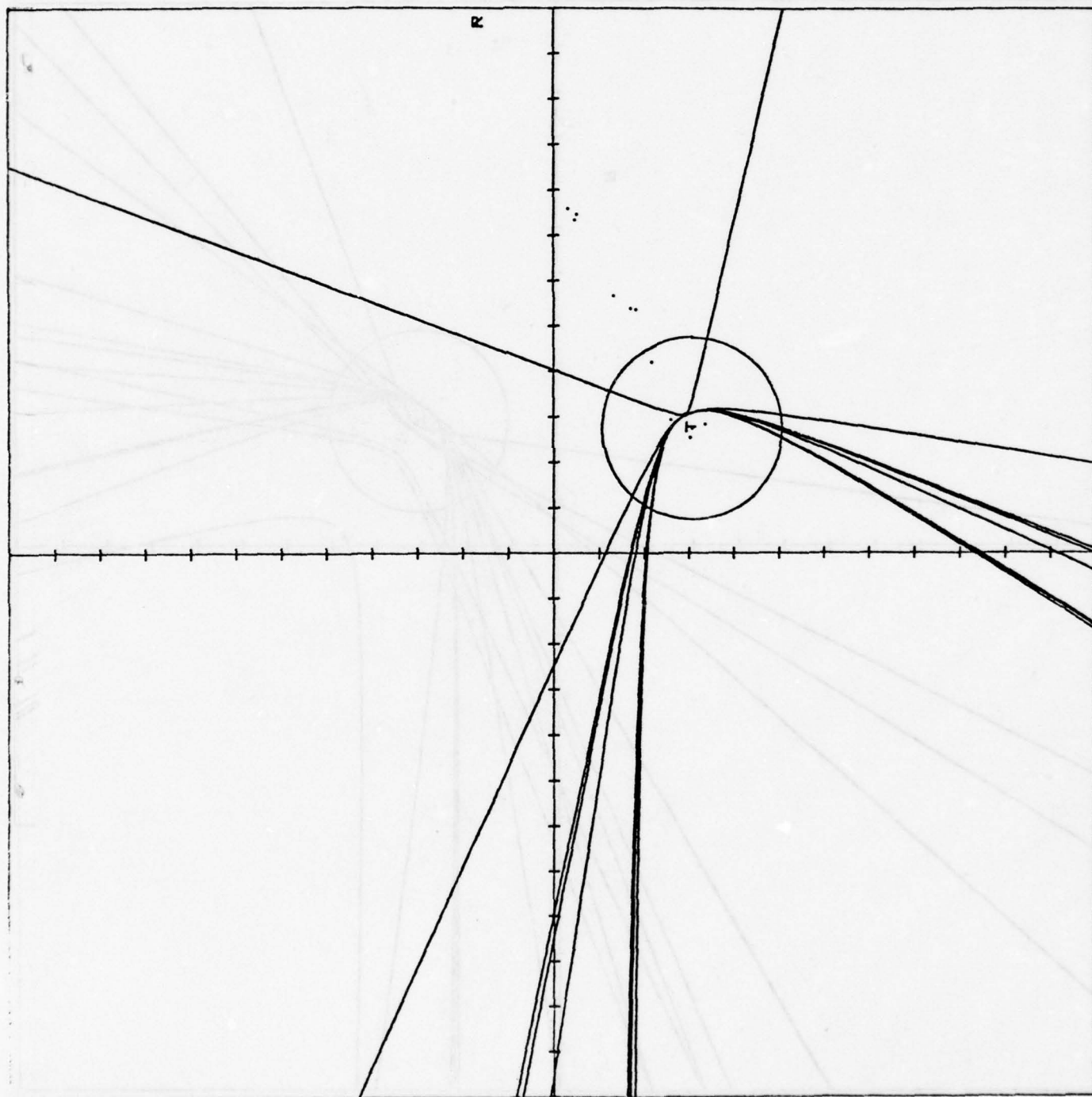
Norton Radar  
Garble Contours  
for Full Density



A-62

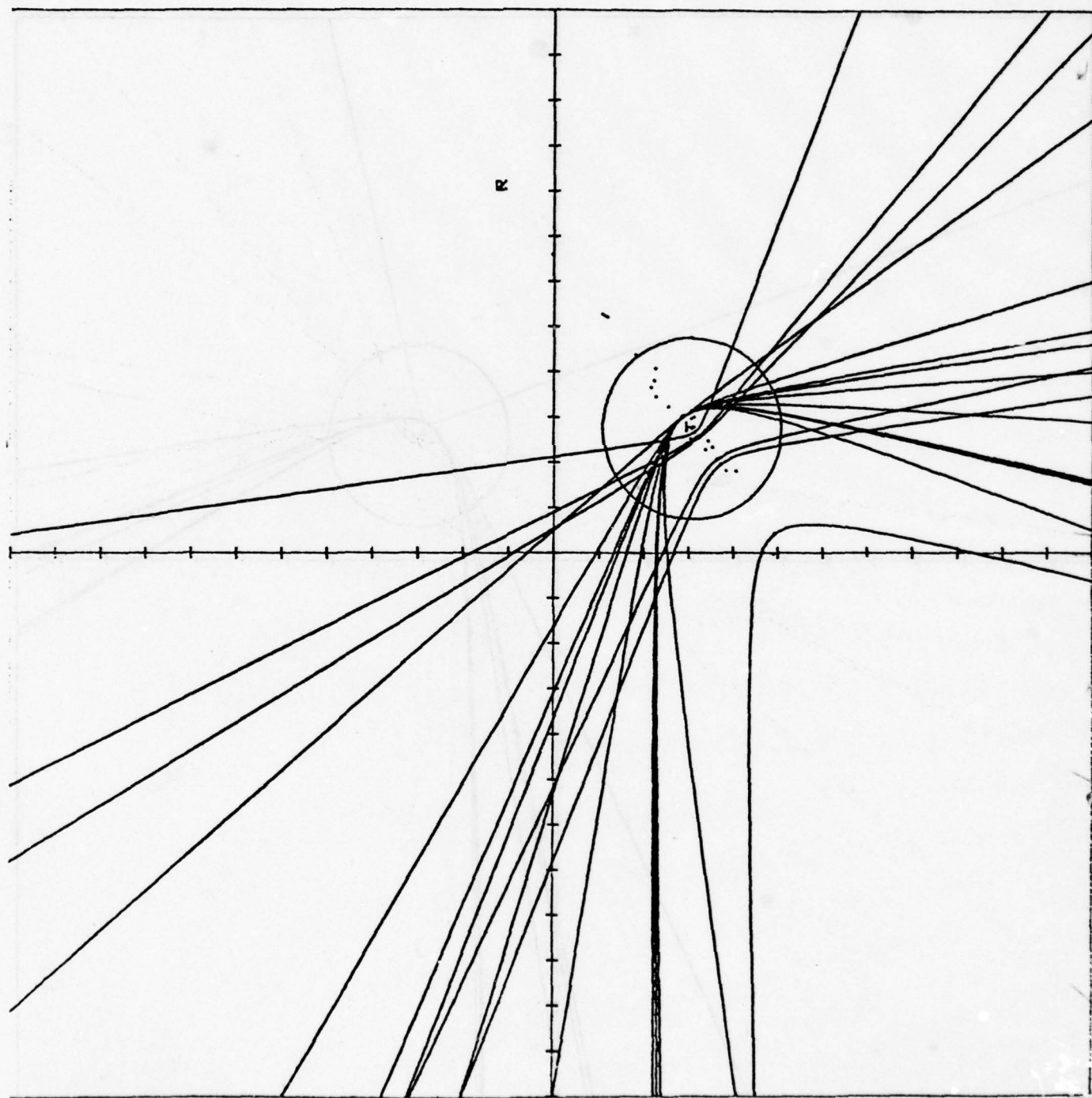


Norton Radar  
Garble Contours  
for Quarter  
Density



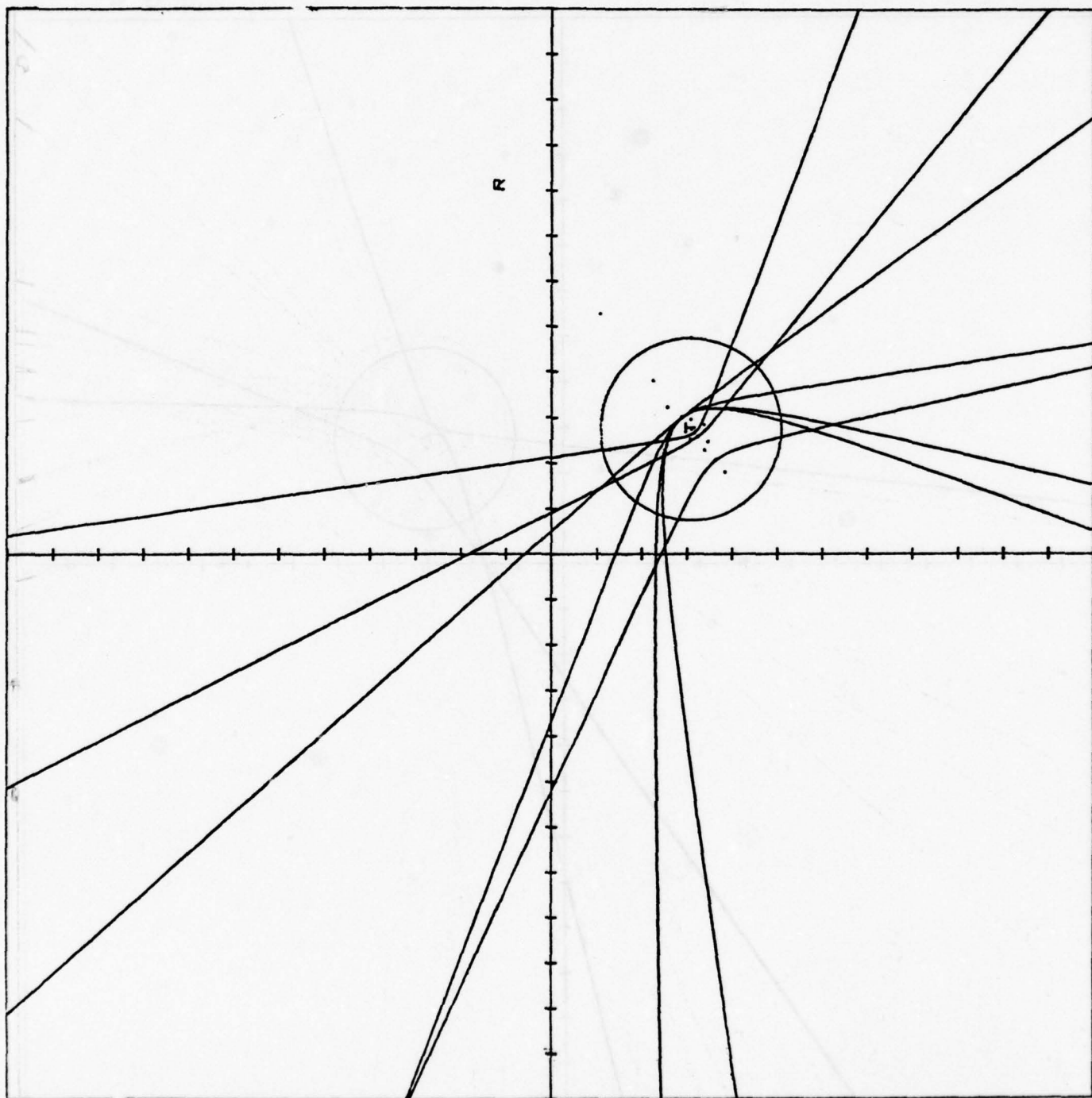


Ontario Radar  
Garble Contours  
for Full Density



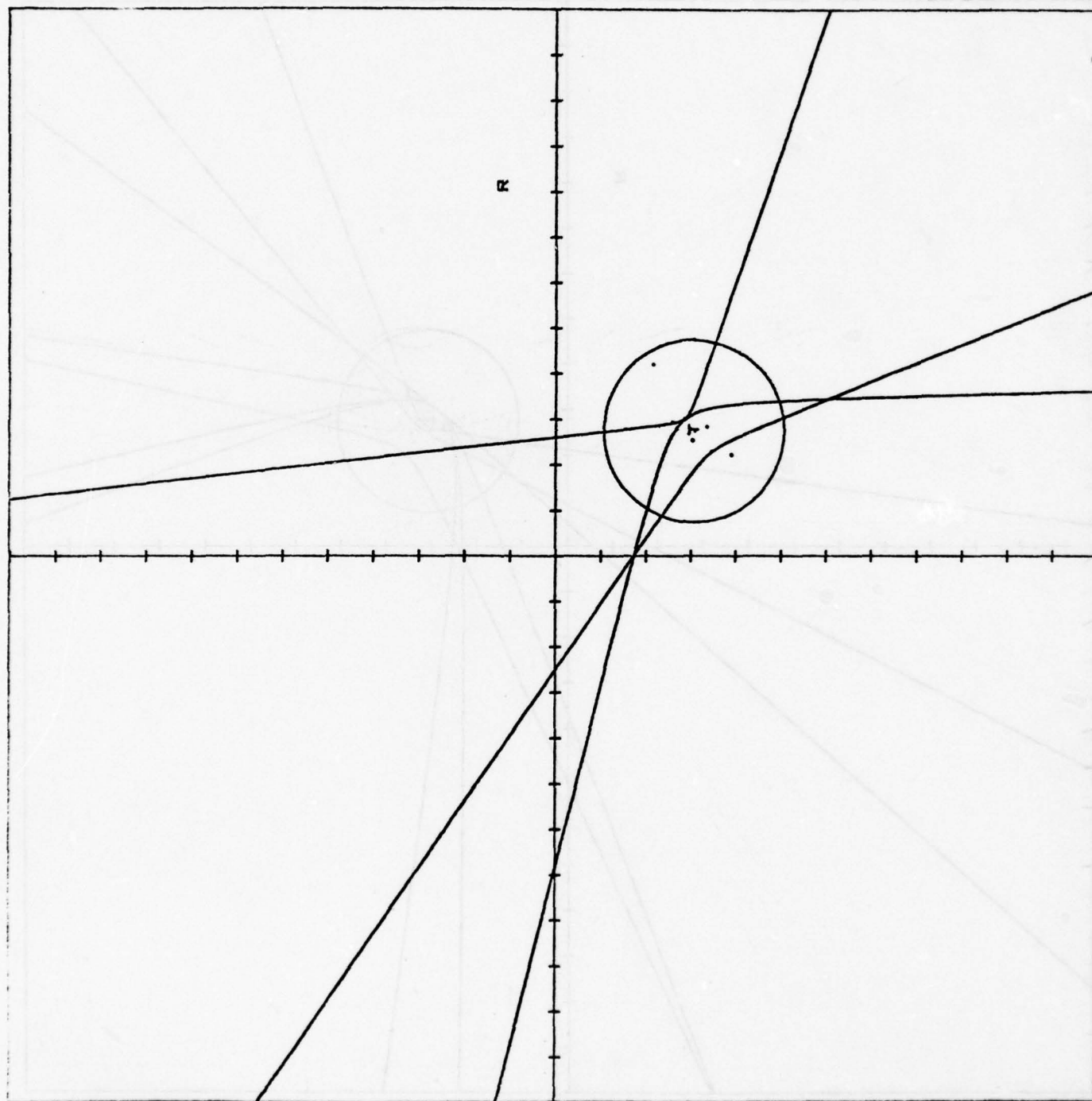


Ontario Radar  
Garble Contours  
for Half Density



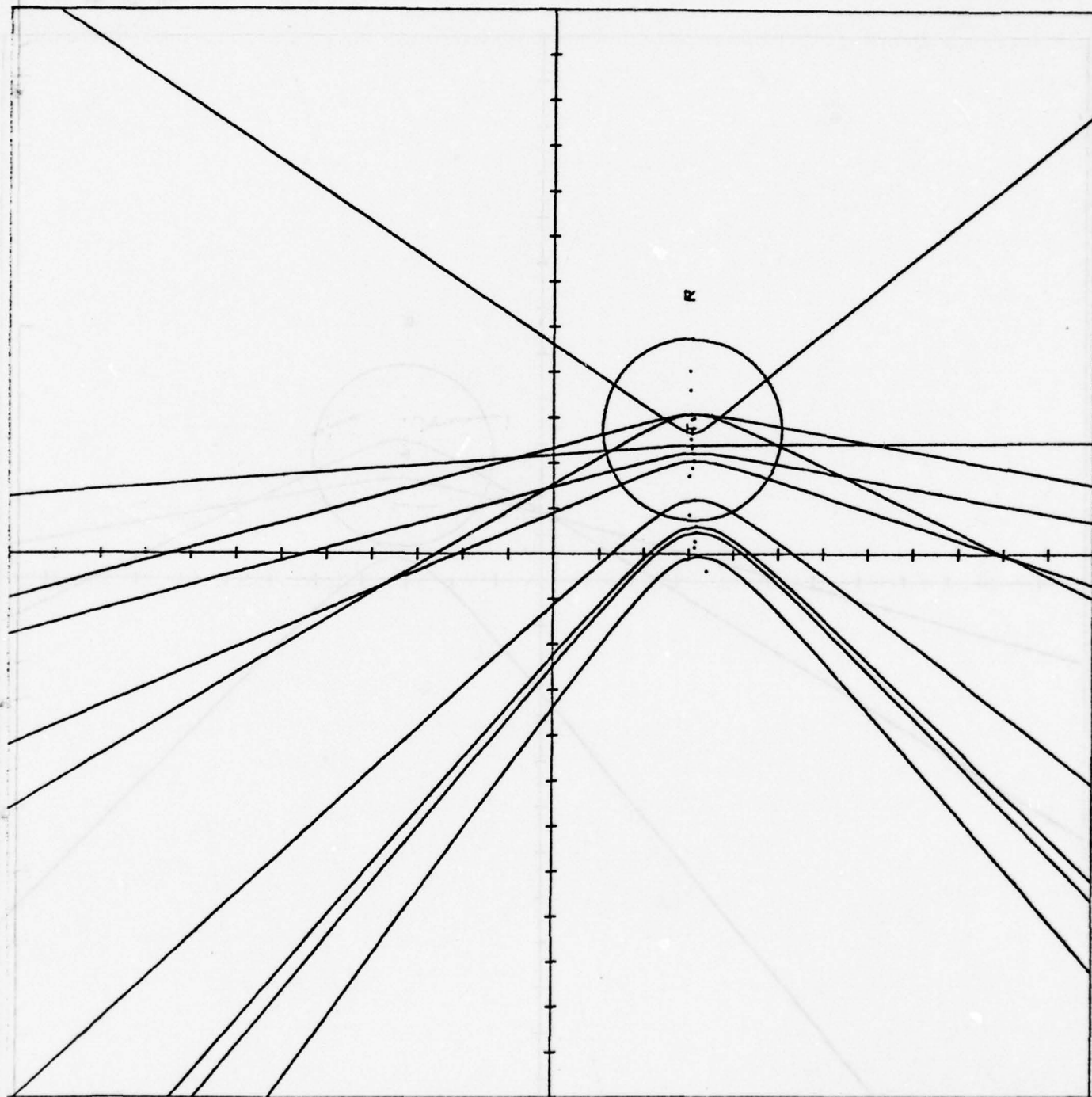


Ontario Radar  
Garble Contours  
for Quarter Density



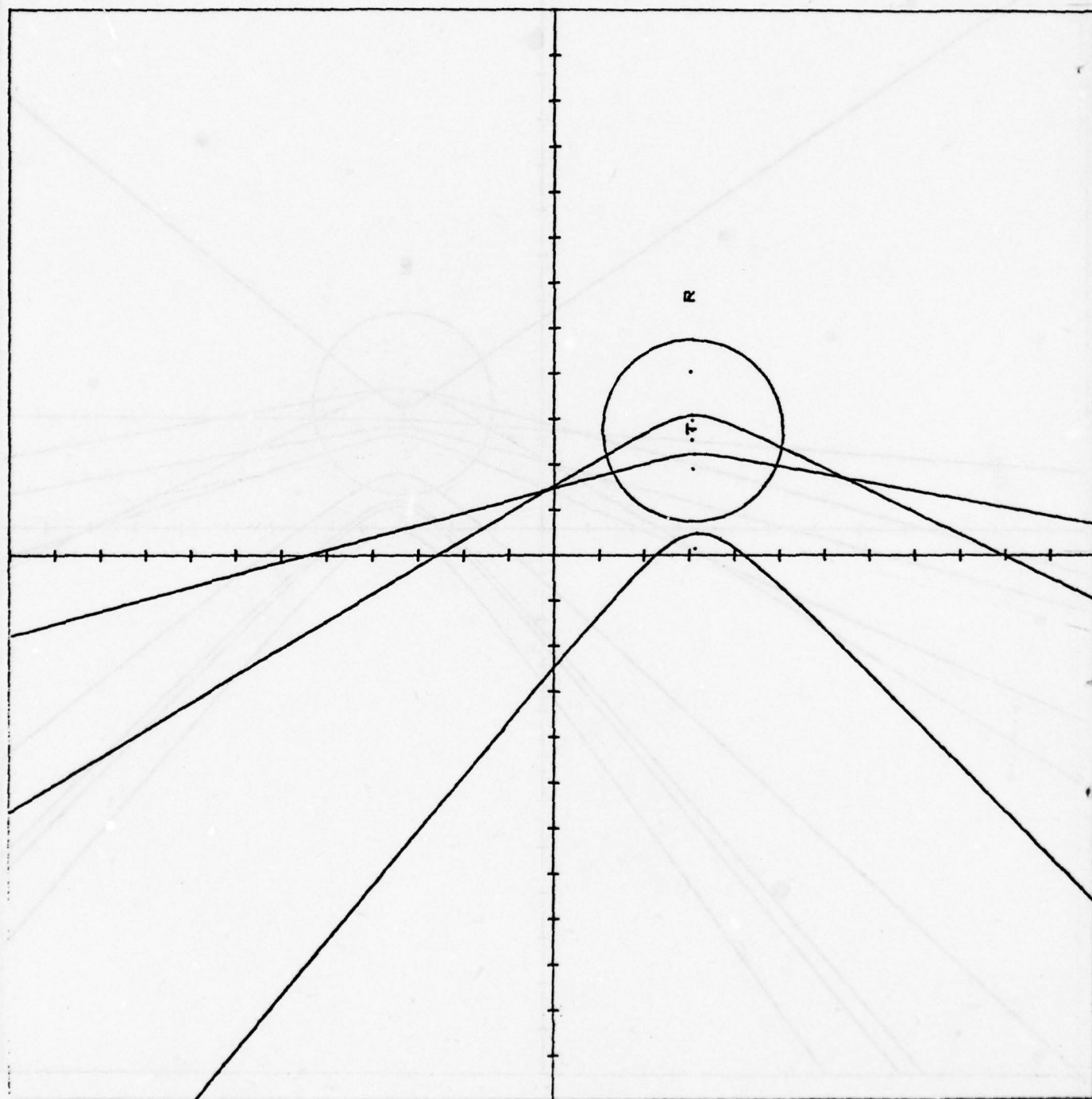


Santa Ana Radar  
Garble Contours  
for Full Density



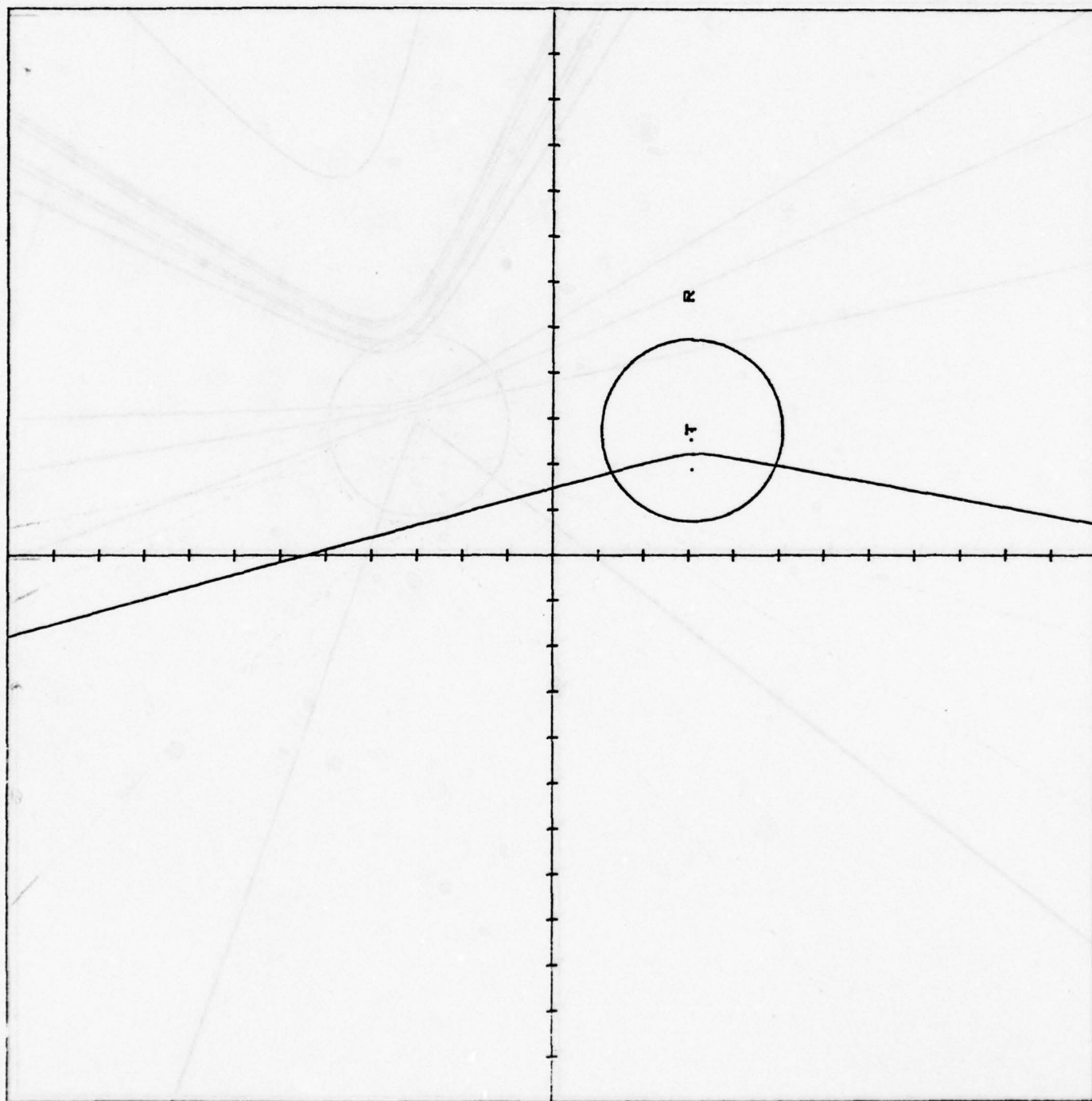


Santa Ana Radar  
Garble Contours  
for Half Density



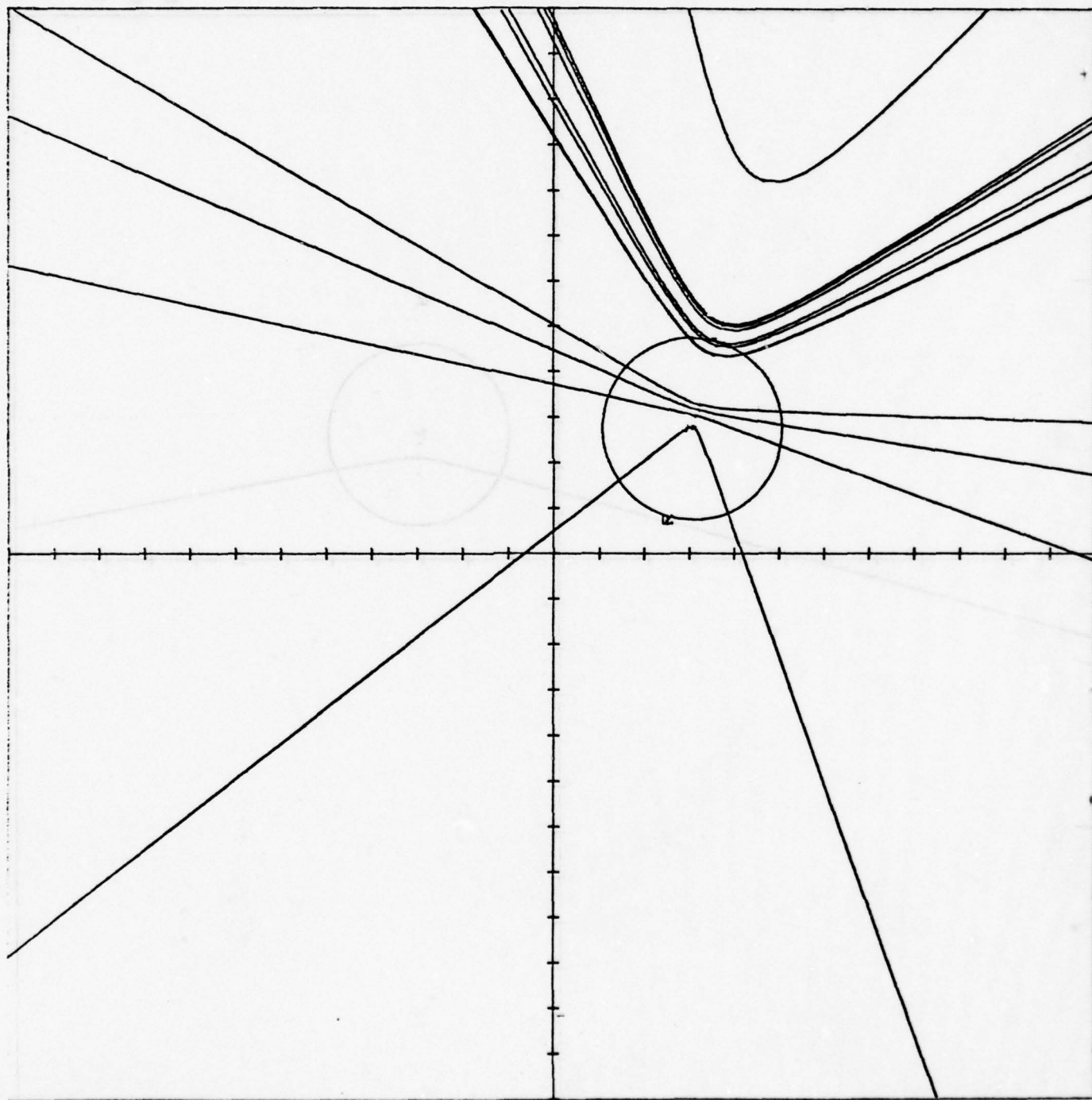


Santa Ana Radar  
Garble Contours  
for Quarter Density



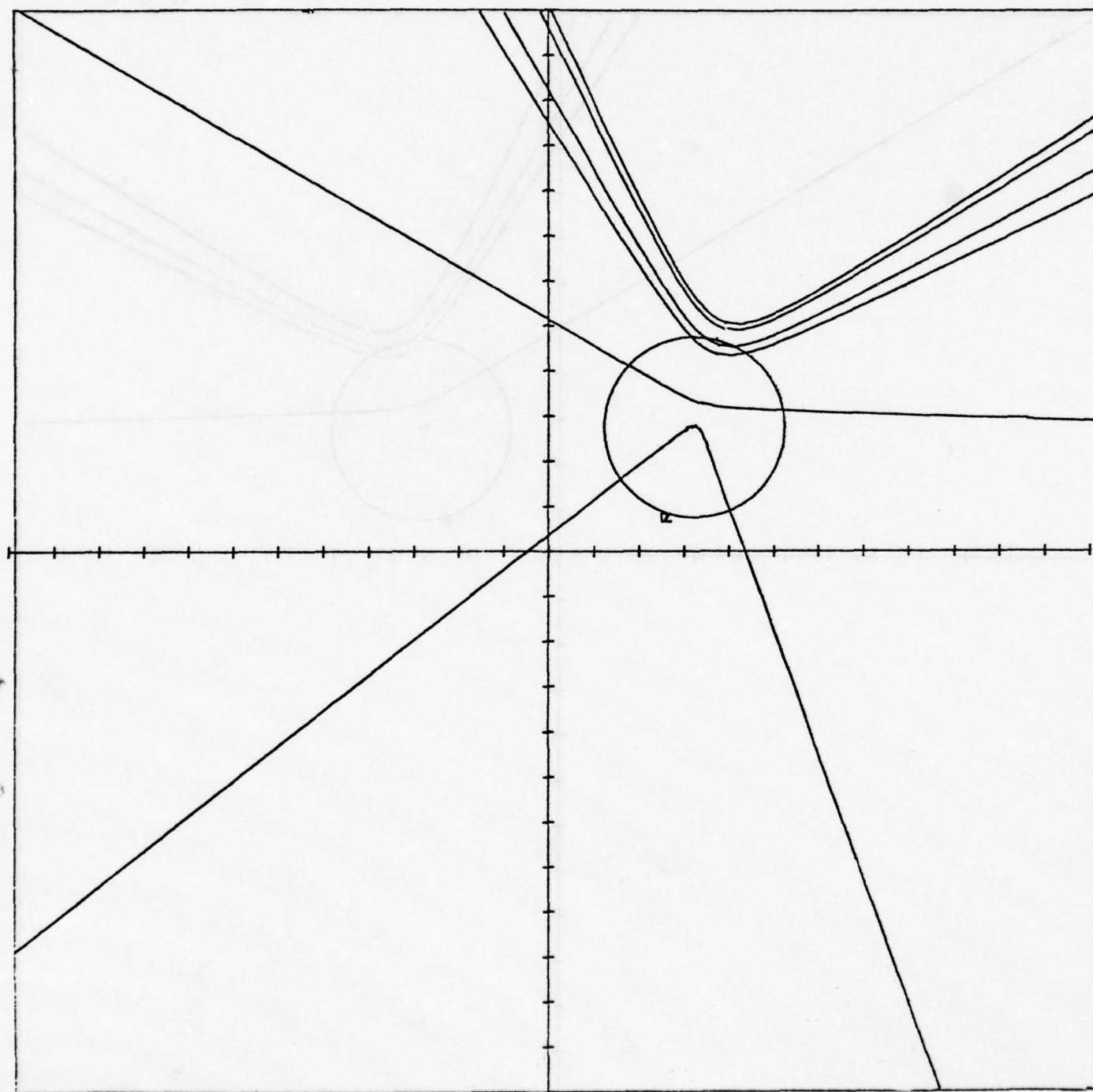


San Pedro Radar  
Garble Contours  
for Full Density



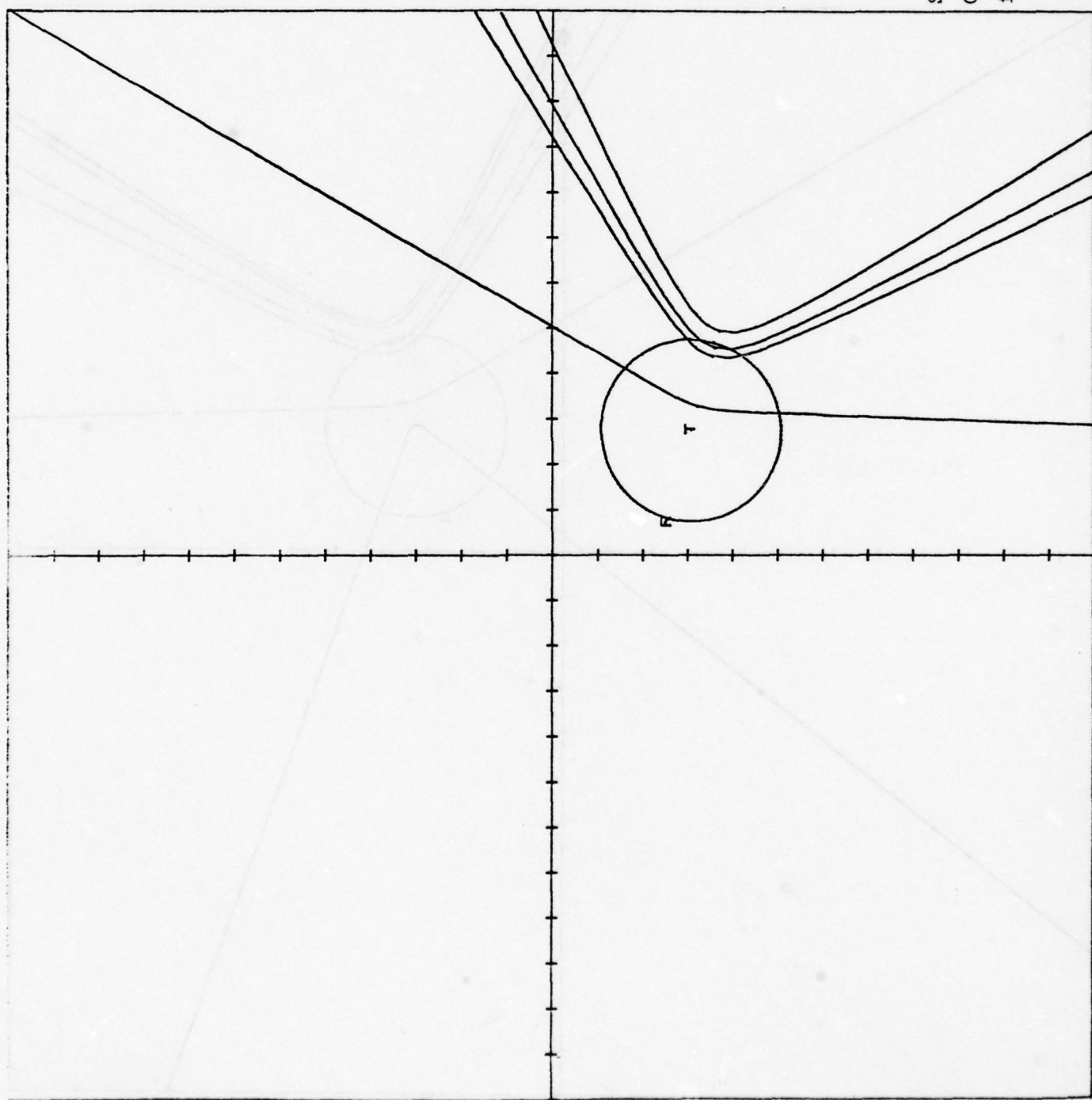


San Pedro Radar  
Garble Contours  
for Half Density





San Pedro Radar  
Garble Contours  
for Quarter Density





APPENDIX A  
ATTACHMENT 2

The following pages contain a source listing and samples of output from the dynamic, three-dimensional BCAS simulation.



```

PROGRAM BCAS (INPUT,OUTPUT,TAPE1,TAPE6,TAPE10)
COMMON/AIRCREF/NAC,RHO1JX(743),RHO1JY(743),ALT(743),RH1JXD(743),
1RH1JYD(743),ALTOOT(743),RH1JXC(743),RH1JYD(743),RNGHCK(743),
2LAC(743),MOBPCW(743),XPOW,ALTO(743),ALTSQ(743)
COMMON/INTER/NINTS,RHO1IX(70),RHO1IY(70),INTID(70),ROTRAT(70),
1PPP(70,8),INTRVL(70),LINT(70),AZSTRT(70),ISTAG(70)
COMMON/BCAS/RHO1BX,RHO1BY,ALTB,RH1BXD,RH1BYD,ALTBOT,RH1BXC,RH1BYC,
1ALTB0,RHOJEC(768),RHOIBC(70)
COMMON/VECMAG/RHOFEN(768,70)
COMMON/TIME/TIME,TNEXT,FRAMET,ENDTIM,ACTIME,IACUPD,FRAMSC
COMMON/TIMEIN/TIMINT(70),TNXINT(70),TINSTR(70)
COMMON/INPUT/COSH0W,REPROB,DPROT,BWOVR2,NTRACK
COMMON/WINDOW/IWIN,IAZWIN(9),TWN8EG(9,3),TWNEND(9,3),TMNPR(9),
1TMXPRT
COMMON/CONST/FT2NM,REARTH,TWO43E,PI,HALFPI,TWOPI,OTR,RTD,C,ONEOVC
COMMON/SORT/SCRT(2000),ISORT(2000),SORTNX(2000),ISCRTX(2000)
COMMON/REPLY/REPNOV(1000),NOWIJP(1000),NOWREP,NEXREP,REPTIM,ISAVE
DIMENSION ISTRDL(9)

C
C***** ESTABLISH CONSTANTS AND INITIAL VALUES OF VARIOUS PARAMETERS. READ
C***** INPUT FILES AND PARAMETERS.
C
TIME=0.
TNEXT=TIME+FRAMET
ICONT=J
NFRAME=1
CALL SETUP

C
C***** UPDATE BCAS POSITION AND DETERMINE AZIMUTH WINDOWS FOR UP TO 9
C***** INTERROGATORS OF INTEREST.
C
1 CALL WINDOW

C
C***** IF BCAS IS NOT WITHIN AN AZIMUTH WINDOW, UPDATE TIME AND TRY AGAIN.
C
IF (IWIN.EQ.0) GO TO 2

C
C***** OTHERWISE CHECK FOR THE BEGINNING OF A SEQUENCE OF CONSECUTIVE
C***** FRAMES. IF IT IS NOT THE BEGINNING, JUMP DOWN AND DETERMINE TIME
C***** WINDOWS FOR RELEVANT INTERROGATORS. IF IT IS THE BEGINNING,
C***** INITIALIZE REPLY ARRAYS, BACK UP TIME BY ONE FRAME, AND DETERMINE
C***** INITIAL INTERROGATION TIMES.
C
IF (ICONT.EQ.1) GO TO 4
NOWREP=0
NEXREP=0
CALL MEMSET (-1.,SORT,2000)
CALL MEMSET (-1.,SORTNX,2000)
NFRAME=1

C
C***** ON INITIAL FRAME, DO NOT BACK UP TO PREVIOUS FRAME.
C
IF (TIME.EQ.0.) GO TO 13
TNEXT=TIME
TIME=TIME-FRAMET

C
C***** DETERMINE INITIAL INTERROGATION TIMES, INCLUDING STAGGERED PRF.

```



```

3
13 DO 7 I=1,NINTS
   IF (ISTAG(I).EQ.1) GO TO 6
   TOTPRP=0.
   IS=ISTAG(I)
   DO 8 K=1,IS
   TOTPRP=TOTPRP+PRF(I,K)
8   CONTINUE
   TTEMP=TIME+TOTPRP-AMOD(TIME-TINSTR(I),TOTPRP)
   IF (TIME-TINSTR(I).LT.0.) TTEMP=TINSTR(I)+TIME
   DO 9 K=1,IS
   TTEST=TTEMP-PRP(I,ISTAG(I)-K+1)
   IF (TTEST.LT.TIME) GO TO 11
   TTEMP=TTEST
9   CONTINUE
   PRINT 12
12  FORMAT (* INITIAL STAGGER TIME ERROR*)
   STOP
11  TIMINT(I)=TTEMP
   INTRVL(I)=ISTAG(I)-K+1
   GO TO 7
6   TIMINT(I)=TIME+PRP(I,1)-AMOD(TIME-TINSTR(I),PRP(I,1))
   IF (TIME-TINSTR(I).LT.0.) TIMINT(I)=TINSTR(I)
7   CONTINUE
   DO 29 M=1,NTRACK
   ISTRDL(M)=0
29  CONTINUE
C
C*****      DETERMINE TIME WINDOWS FOR RELEVANT INTERROGATORS
C
4   DO 15 M=1,NTRACK
   IF (IAZWIN(M).EQ.0) GO TO 15
   IF (ISTAG(M).EQ.1) GO TO 22
   IS1=INTRVL(M)+1
   IF (IS1.GT.ISTAG(M)) IS1=1
   IS2=IS1+1
   IF (IS2.GT.ISTAG(M)) IS2=1
   IF (ISTRDL(M).EQ.0) GO TO 21
   IF (ISTRDL(M).EQ.1) GO TO 26
   ISTRDL(M)=0
   TWINBEG(M,1)=TWINBEG(M,2)
   TWINEND(M,1)=TWINEND(M,2)
   TWINBEG(M,2)=TWINBEG(M,3)
   TWINEND(M,2)=TWINEND(M,3)
   TWINBEG(M,3)=TWINBEG(M,2)+PRP(M,IS1)
   TWINEND(M,3)=TWINBEG(M,3)+TMXPRT
   IF (TIMINT(M).LT.TNEXT.AND.TWINEND(M,1).GT.TNEXT) ISTRDL(M)=1
   IF ((TIMINT(M)+PRP(M,IS1)).LT.TNEXT.AND.TWINEND(M,2).GT.TNEXT)
1  ISTRDL(M)=2
   GO TO 14
26  ISTRDL(M)=0
   IF (TIMINT(M).LT.TNEXT.AND.TWINEND(M,1).GT.TNEXT) ISTRDL(M)=1
   IF ((TIMINT(M)+PRP(M,IS1)).LT.TNEXT.AND.TWINEND(M,2).GT.TNEXT)
1  ISTRDL(M)=2
   GO TO 14
21  TWINBEG(M,1)=TIMINT(M)+TMNPRT(M)
   TWINEND(M,1)=TWINBEG(M,1)+TMXPRT

```



```

      TWNBEG(M,2)=TWNBEG(M,1)+PRP(M,IS1)
      TWNEND(M,2)=TWNBEG(M,2)+TMXPRT
      TWNBEG(M,3)=TWNBEG(M,2)+PRP(M,IS2)
      TWNEND(M,3)=TWNBEG(M,3)+TMXPRT
      IF (TIMINT(M).LT.TNEXT.AND.TWNEND(M,1).GT.TNEXT) ISTRDL(M)=1
      IF ((TIMINT(M)+PRP(M,IS1)).LT.TNEXT.AND.TWNEND(M,2).GT.TNEXT)
1 ISTRDL(M)=2
      GO TO 14
22  IF (ISTRDL(M).EQ.0) GO TO 23
      IF (ISTRDL(M).EQ.1) GO TO 27
      ISTRDL(M)=0
      TWNBEG(M,1)=TWNBEG(M,2)
      TWNEND(M,1)=TWNEND(M,2)
      TWNBEG(M,2)=TWNBEG(M,3)
      TWNEND(M,2)=TWNEND(M,3)
      TWNBEG(M,3)=TWNBEG(M,2)+PRP(M,1)
      TWNEND(M,3)=TWNBEG(M,3)+TMXPRT
      IF (TIMINT(M).LT.TNEXT.AND.TWNEND(M,1).GT.TNEXT) ISTRDL(M)=1
      IF ((TIMINT(M)+PRP(M,1)).LT.TNEXT.AND.TWNEND(M,2).GT.TNEXT)
1 ISTRDL(M)=2
      GO TO 14
27  ISTRDL(M)=0
      IF (TIMINT(M).LT.TNEXT.AND.TWNEND(M,1).GT.TNEXT) ISTRDL(M)=1
      IF ((TIMINT(M)+PRP(M,1)).LT.TNEXT.AND.TWNEND(M,2).GT.TNEXT)
1 ISTRDL(M)=2
      GO TO 14
20  TWNBEG(M,1)=TIMINT(M)+TMNPRT(M)
      TWNEND(M,1)=TWNBEG(M,1)+TMXPRT
      TWNBEG(M,2)=TWNBEG(M,1)+PRP(M,1)
      TWNEND(M,2)=TWNBEG(M,2)+TMXPRT
      TWNBEG(M,3)=TWNBEG(M,2)+PRP(M,1)
      TWNEND(M,3)=TWNBEG(M,3)+TMXPRT
      IF (TIMINT(M).LT.TNEXT.AND.TWNEND(M,1).GT.TNEXT) ISTRDL(M)=1
      IF ((TIMINT(M)+PRP(M,1)).LT.TNEXT.AND.TWNEND(M,2).GT.TNEXT)
1 ISTRDL(M)=2
14  PRINT 114,INTID(M),TIME,TNEXT,TIMINT(M),(TWNBEG(M,K),TWNEND(M,K),
1K=1,3)
114  FORMAT (/T29,I3,3F11.7,2X,*WIN*,3(2X,2F11.6))
15  CONTINUE
      CALL FRAME
      ICONT=1

C ***** ORDER REPLIES CHRONOLOGICALLY BY PACKING PRE-SORTED ARRAY AND
C ***** APPLYING BUBBLE SORT

      IF (NOWREP.EQ.0) GO TO 18
      CALL CHRONC

C ***** PRINT RESULTS

C ***** CALL OUTPUT

C ***** MOVE REPLY ARRAY FROM NEXT TO CURRENT FRAME (UNPACKED)

      NOWREP=NEXREP
      STRREP=0
      CALL NOWREP (SORTNX,SORT,40J01)

```



BCAS

74/74 OPT=2

FIN 4.6\*433B

03/09/70 22.

```

CALL MEMSET (-1.,SORTNX,2000)
C*****
C***** UPDATE AIRCRAFT POSITIONS (AND RELATED PARAMETERS) AT APPROPRIATE
C***** INTERVAL.
C
IF (NFRAME.EQ.IACUPD) GO TO 5
NFRAME=NFRAME+1
GO TO 3
5 NFRAME=1
PRINT 105,RHO1BX,RHO1BY,ALTB,(J,RHO1JX(J),RHO1JY(J),ALT(J),
1 RHO1JC(J),J=1,NAC)
105 FORMAT (1H1,*BCAS POSITION IS *3F10.2//)* AIRCRAFT DATA (NO. X
1 Y ALT RANGE FROM BCAS)*//((I4,2F8.2,F9.1,F7.2,14X,I4,2F8.2,
2 F9.1,F7.2,14X,I4,2F8.2,F9.1,F7.2))
CALL MOVEAC
GO TO 3
2 ICONT=0
C
C***** UPDATE TIME AND CHECK FOR END OF SIMULATION.
C
3 TIME=TNEXT
IF (TIME.GT.ENDTIM) GO TO 10
TNEXT=TNEXT+FRAMET
GO TO 1
10 ENDFILE 10
REWIND 10
STOP
END

```

REFERENCE MAP (R=1)

TYPE	RELOCATION					
REAL	TIME	2717	ALT	REAL	ARRAY	AIRCRF
REAL	BCAS	5	ALTBOT	REAL		BCAS
REAL	BCAS	7204	ALTDOT	REAL	ARRAY	AIRCRF
REAL	ARRAY AIRCRF	17757	ALTO	REAL	ARRAY	AIRCRF
REAL	ARRAY INTER	3	RWOVR2	REAL		INPUT
REAL	CONST	0	COSHBW	REAL		INPUT
REAL	INPUT	6	DTR	REAL		CCNST
REAL	TIME	2	FRAMET	REAL		TIME
REAL	TIME	0	FT2NM	REAL		CCNST
REAL	CONST	13016	I	INTEGER		
INTEGER	TIME	1	IAZWIN	INTEGER	ARRAY	WINDOW
INTEGER		215	INTID	INTEGER	ARRAY	INTER
INTEGER	ARRAY INTER	13020	IS	INTEGER		
INTEGER	REPLY	3720	ISORT	INTEGER	ARRAY	SCRT
INTEGER	ARRAY SORT	2033	ISTAG	INTEGER	ARRAY	INTER
INTEGER	ARRAY	13025	IS1	INTEGER		
INTEGER		0	IWIN	INTEGER		WINDOW
INTEGER		13021	K	INTEGER		



ROUTINE WINDOW

74/74 OPT=2

FTN 4.6+433B

03/30/71

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SUBROUTINE WINDOW
COMMON/BCAS/RHO1BX,RHO1BY,ALTB,RH1BXD,RH1BYD,ALTBOT,RH1BX0,RH1BY0,
1ALT80,RHOJEC(768),RHOIBC(70)
COMMON/WINDOW/IWIN,IAZWIN(9),TWNBE(9,3),TWNEND(9,3),TMNPRT(9),
1TMXPRT
COMMON/INTER/NINTS,RHO1IX(70),RHO1IY(70),INTID(70),ROTRAT(70),
1PRP(70,8),INTRVL(70),LINT(70),AZSTRT(70),ISTAG(70)
COMMON/TIME/TIME,TNEXT,FRAMET,ENDTIM,ACTIME,IACUPD,FRAMSC
COMMON/INPUT/COSHBW,REPROB,CFROT,BWOVR2,NTRACK
COMMON/CONST/FT2NM,REARTH,TW043E,PI,HALFPI,TW0PI,DTR,RTD,C,ONEOVC
COMMON/AZ/AZINT
IWIN=0

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```

C
C***** COMPUTE BCAS POSITION
C
RHO1BX=RH1BX0+RH1BXD*TIME
RHO1BY=RH1BY0+RH1BYD*TIME
ALTB=ALT80+ALTBOT*TIME
DO 10 I=1,NTRACK
IAZWIN(I)=0

C
C***** COMPUTE INTERROGATOR AZIMUTH
C
AZINT=AZSTRT(I)+ROTRAT(I)*TIME
AZX=SIN(AZINT)
AZY=COS(AZINT)
RHO1BX=-RHO1IX(I)+RHO1BX
RHO1BY=-RHO1IY(I)+RHO1BY
RH9XY2=RHO1BX*RHO1BX+RHO1BY*RHO1BY
RHOIBC(I)=SQRT(RH9XY2+ALTB*ALTB)
RHBCXY=SQRT(RH9XY2)
TMNPRT(I)=RHOIBC(I)/C + 3.E-06
CPRTAN=COS(ATAN(DPROT/RHBCXY)+BWOVR2)
COSANG=(AZX*RHO1BX+AZY*RHO1BY)/RHBCXY
IF (COSANG.LT.CPRTAN) GO TO 10
IAZWIN(I)=1
IWIN=1
10 CONTINUE
RETURN
END

```

POLIC REFERENCE MAP (R=1)

4S  
DCW

	SN	TYPE	RELLOCATION				
INT		REAL	TIME	2	ALTB	REAL	BCAS
ROT		REAL	BCAS	10	ALTB0	REAL	BCAS
AT		REAL	AZ	1725	AZSTRT	REAL	INTER
		REAL		63	AZY	REAL	
PRP		REAL	INPUT	10	C	REAL	CONST
AWG		REAL		0	COSHBW	REAL	INPUT



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SUBROUTINE FRAME
COMMON/AIRCRAFT/NAC,RH01JX(743),RH01JY(743),ALT(743),RH1JXD(743),
1RH1JYD(743),ALTDOT(743),RH1JXD(743),RH1JYD(743),RNGHCR(743),
2LAC(743),PCBPCW(743),XPOW,ALTD(743),ALTSQ(743)
COMMON/BCAS/RH01BX,RH01BY,ALTB,RH1BXD,RH1BYD,ALTBOT,RH1BXD,RH1BYD,
1ALTBG,RHOJEC(768),RHOIBC(70)
COMMON/INTER/NINTS,RH01IX(70),RH01IY(70),INTID(70),ROTRAT(70),
1PRP(70,8),INTRVL(70),LINT(70),AZSTRT(70),ISTAG(70)
COMMON/VECMAG/RHOFEN(768,70)
COMMON/TIME/TIME,TNEXT,FRAMET,ENDTIM,ACTIME,IACUPD,FRAMSC
COMMON/TIMEIN/TIMINT(70),TNXINT(70),TINSTR(70)
COMMON/INPUT/COSH3W,REPROB,OPROT,BWVR2,NTRACK
COMMON/CONST/FT2NM,REARTH,TWO43E,PI,HALFPI,TWOPI,DTR,RTD,C,ONEOVC
COMMON/SORT/SORT(2000),ISORT(2000),SORTNX(2000),ISCRTX(2000)
COMMON/REPLY/REPNOV(1000),NCWIJP(1000),NOWREP,NEXREF,REPTIM,ISAVE

C
C*****      START OF MAIN INTERROGATION LOOP
C
1      DO 15 I=1,NINTS
C
C*****      IF THERE IS NO INTERROGATION THIS FRAME, GO TO NEXT INTERROGATION.
C
      IF (TIMINT(I).GE.TNEXT) GO TO 15
C
C*****      UPDATE NEXT INTERROGATION TIME, ALLOWING FOR STAGGERED PRF.
C
      IF (ISTAG(I).EQ.1) GO TO 2
      INTRVL(I)=INTRVL(I)+1
      IF (INTRVL(I).GT.ISTAG(I)) INTRVL(I)=1
      TNXINT(I)=TIMINT(I)+PRP(I,INTRVL(I))
2
C
C*****      SET SECOND FRAME INTERROGATION FLAG TO APPROPRIATE VALUE.
C
      INTNO2=1
      IF (TNXINT(I).LT.TNEXT) INTNO2=2
C
C*****      CALCULATE INTERROGATOR BEAM AZIMUTH
C
      AZINT=AZSTRT(I)+ROTRAT(I)*TIME
      AZX=SIN(AZINT)
      AZY=COS(AZINT)
C
C*****      COMPUTE INTERMEDIATE VARIABLES
C
      TINTP3=TIMINT(I)+3.E-06
      TNEXP3=TNXINT(I)+3.E-06
C
C*****      START OF MAIN AIRCRAFT LOOP
C
      DO 10 J=1,NAC
C
C*****      CALCULATE DOT PRODUCT OF INTERROGATOR AZIMUTH UNIT VECTOR AND RANGE
C*****      VECTOR FROM INTERROGATOR TO AIRCRAFT.
C
      CTHETA=(AZX*(RH01JX(J)-RH01IX(I))+AZY*(RH01JY(J)-RH01IY(I)))*
1RHOFEN(J,I)
C

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C***** IF AIRCRAFT IS NOT WITHIN INTERROGATOR MAIN BEAM, GO TO NEXT AIRCRAFT
C
      IF (CTHETA.LT.COSHBW) GO TO 10
C
C***** IF AIRCRAFT IS NOT VISIBLE ABOVE THE HORIZON, GO TO NEXT AIRCRAFT
C
      RHOIJM=SQRT((1./(RHOFCN(J,I)*RHOFCN(J,I)))+ALTSC(J))
      IF (RHOIJM.GE.RNGHOR(J)) GO TO 10
C
C***** IF FIRST REPLY IS NOT MISSED DUE TO REPLY PROBABILITY, CHECK FOR A
C***** SECOND INTERROGATION THIS FRAME.
C
      IF (RANF(DUM).LE.REPROB) GO TO 4
C
C***** FIRST REPLY MISSED DUE TO REPLY PROBABILITY. IF NO SECOND
C***** INTERROGATION THIS FRAME, GO TO NEXT AIRCRAFT.
C
      IF (INTNO2.EQ.1) GO TO 10
C
C***** OTHERWISE, CHECK FOR SECOND REPLY PROBABILITY. IF MISSED, GO TO NEXT
C***** AIRCRAFT.
C
      IF (RANF(DUM).GT.REPROB) GO TO 10
C
C***** OTHERWISE, COMPUTE ARRIVAL TIME FOR SECOND REPLY AND STORE IN
C***** APPROPRIATE ARRAY.
C
      REPTIM=TNEXP3+(RHOIJM+RHOJBC(J))*ONEOVC
      IF (REPTIM.GE.TNEXT) GO TO 3
      ISAVE=LINT(I)+MDBPOW(J)
      CALL SRTNOK
      GO TO 10
3     ISAVE=LINT(I)+MDBPOW(J)
      CALL SRTNEX
      GO TO 10
C
C***** FIRST REPLY IS OK. LOOK FOR A SECOND INTERROGATION THIS FRAME.
C
4     IF (INTNO2.EQ.1) GO TO 8
C
C***** SECOND INTERROGATION OCCURS LATER THIS FRAME. COMPUTE FIRST REPLY
C***** ARRIVAL TIME.
C
      REPTIM=TINTP3+(RHOIJM+RHOJBC(J))*CNEOVC
      IF (REPTIM.GE.TNEXT) GO TO 7
C
C***** FIRST REPLY ARRIVAL OCCURS THIS FRAME. STORE ACCORDINGLY.
C
      ISAVE=LINT(I)+MDBPOW(J)
      CALL SRTNOK
C
C***** CHECK FOR SECOND REPLY PROBABILITY. IF MISSED, GO TO NEXT AIRCRAFT.
C
      IF (RANF(DUM).GT.REPROB) GO TO 10
C
C***** OTHERWISE, COMPUTE ARRIVAL TIME FOR SECOND REPLY AND STORE IN
C***** APPROPRIATE ARRAY.

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C      REPTIM=REPTIM+PRP(I,INTRVL(I))
      IF (REPTIM.GE.TNEXT) GO TO 5
      ISAVE=LINT(I)+MOBPOW(J)
      CALL SRTNOW
      GO TO 10
5      ISAVE=LINT(I)+MOBPOW(J)
      CALL SRTNEX
      GO TO 10

C      C*****      FIRST OF TWO REPLIES OCCURS IN NEXT FRAME.  STORE ACCORDINGLY.
C
C      7      ISAVE=LINT(I)+MOBPOW(J)
      CALL SRTNEX

C      C*****      CHECK FOR SECOND REPLY PROBABILITY.  IF MISSED, GO TO NEXT AIRCRAFT.
C
C      IF (RANF(DLM).GT.REPROB) GO TO 10

C      C*****      OTHERWISE, COMPUTE ARRIVAL TIME FOR SECOND REPLY AND STORE IN NEXT
C      C*****      FRAME ARRAY.
C
      REPTIM=REPTIM+PRP(I,INTRVL(I))
      ISAVE=LINT(I)+MOBPOW(J)
      CALL SRTNEX
      GO TO 10

C      C*****      ONLY ONE INTERROGATION OCCURS THIS FRAME.  COMPUTE RESULTING REPLY
C      C*****      ARRIVAL TIME AND STORE ACCORDINGLY.
C
C      8      REPTIM=TINIP3+(RHOIJM+RHOJBC(J))*ONEOV
      IF (REPTIM.LT.TNEXT) GO TO 9
      ISAVE=LINT(I)+MOBPOW(J)
      CALL SRTNEX
      GO TO 10
9      ISAVE=LINT(I)+MOBPOW(J)
      CALL SRTNOW
10     CONTINUE

C      C*****      UPDATE INTERROGATION TIME
C
      IF (INTNO2.EQ.1) GO TO 11
      IF (ISTAG(I).EQ.1) GO TO 12
      INTRVL(I)=INTRVL(I)+1
      IF (INTRVL(I).GT.ISTAG(I)) INTRVL(I)=1
12     TNXINT(I)=TNXINT(I)+PRP(I,INTRVL(I))
11     TIMINT(I)=TNXINT(I)

C      C*****      IF REPLY ARRAY EXCEEDS 900 ELEMENTS, PRINT WARNING.
C
      IF (NOWREP.GT.900) PRINT 101
101    FORMAT (* WARNING - REPLY ARRAY (PEPNOW) EXCEEDS 900 ELEMNTS.*)
15     CONTINUE
      RETURN
      END

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```

SUBROUTINE SETUP
COMMON/AIRGRF/NAC,RHO1JX(743),PHO1JY(743),ALT(743),RH1JXD(743),
1RH1JYD(743),ALTDOT(743),RH1JXC(743),RH1JYJ(743),RNGHOR(743),
2LAC(743),MCBPOW(743),XPOW,ALTD(743),ALTSQ(743)
COMMON/BCAS/RHO1BX,RHO1BY,ALTB,RH1BXD,RH1BYD,ALTBOT,RH1BXC,RH1BYC,
1ALTBQ,RHOJEC(768),RHOIBC(70)
COMMON/INTER/NINTS,RHO1IX(70),RHO1IY(70),INTID(70),ROTRAT(70),
1PRP(70,8),INTRVL(70),LINT(70),AZSTRT(70),ISTAG(70)
COMMON/WINDOW/IWIN,IAZWIN(9),TWNBEQ(9,3),TWNEND(9,3),TMNPRT(9),
1TMXPRT
COMMON/TIME/TIME,TNEXT,FRAMET,ENDTIM,ACTIME,IACUPD,FRAMSC
COMMON/TIMEIN/TIMINT(70),TNXINT(70),TINSTR(70)
COMMON/INFUT/COSHBW,REPROB,DPROT,BWQVR2,NTRACK
COMMON/CONST/FT2NM,REARTH,TWO43E,PI,HALFPI,TWOPI,DTR,RTD,C,ONEOVC
COMMON/SORT/SCRT(2000),ISORT(2000),SORTNX(2000),ISCRTX(2000)
COMMON/REPLY/REPNOV(1000),NOWIJP(1000),NOWREP,NEXREF,REPTIM,ISAVE
DIMENSION LAT(75,3),LONG(75,3),CAR(3),AOUT(3)
NAC=743
FT2NM=1./6076.12
REARTH=3437.747
TWO43E=2.*(4./3.)*REARTH
PI=3.1415926535898
HALFPI=0.5*PI
TWOPI=2.*PI
DTR=PI/180.
RTD=180./PI
C=161875.
ONEOVC=1./C
READ 1,FRAMET,ENDTIM,NTRACK,IACUPD,REPROB,BMWOTH,DISCIN,XPOW,
1DPROT,RH1BXD,RH1BYD,ALTBQ,RH1BXD,RH1BYD,ALTBOT
1 FORMAT (2F10.0,2I5,5F10.0/6F10.0)
PRINT 200,TIME,FRAMET,ENDTIM,RH1BXD,RH1BYD,ALTBQ,RH1BXD,RH1BYD,
1ALTBOT,NAC,IACUPD,XPOW,REPROB,DISCIN,BMWOTH
PRINT 201,NTRACK,DPROT
200 FORMAT (T52,*BCAS SIMULATION INPUT PARAMETERS*////6H *****,*TIME*
16H *****//T57,*START TIME =*F11.7/T57,*FRAME TIME =*F11.7/T59,
2*END TIME =*F11.7//6H *****,*GEOMETRY*,6H *****//
3* THE CARTESIAN FRAME USED THROUGHOUT THIS FLAT-EARTH SIMULATION IS
4S CENTERED AT INTERROGATOR NO. 1 WITH X EAST, Y NORTH, AND Z UP.*//
5* A CALCULATION IS PERFORMED TO DISCOUNT AIRCRAFT THAT WOULD BE OV
6ER THE RADAR HORIZON IN A SPHERICAL-EARTH MODEL.*//6H *****BCAS*
76H *****//* BCAS AIRCRAFT POSITION (NM,NM,FT) AND VELOCITY (KT,KT,
8FPM) AT TIME=0 ARE/* X =*F7.2,*, Y =*F7.2,*, Z =*F8.1,*, XO
9OT =*F6.1,*, YDOT =*F6.1,*, ZDOT =*F7.1,*.*/6H *****,* TARGE
1T AIRCRAFT*,6H *****//I4,* TARGET AIRCRAFT POSITIONS WILL BE UPDAT
2ED EVERY*I3,* FRAMES. (POSITIONS ARE LISTED ON SUBSEQUENT PAGES.
3)*// ALL AIRCRAFT ARE ASSUMED TO BE EQUIPPED WITH TRANSPONDERS THA
4T RADIATE *F4.0,* WATTS OF POWER WITH NO ATTENUATION OTHER THAN A*
5/* RANGE-DEPENDENT PROPAGATION LOSS. THE TRANSPONDERS HAVE A REPL
6Y PROBABILITY OF *F4.2,*.*/6H *****,*INTERROGATORS*,6H *****//
7* UP TO 70 INTERROGATORS WITHIN *,F4.0,* NM OF INTERROGATOR NO. 1
8ARE INCLUDED IN THE SIMULATION. THEIR INTERROGATION BEAMWIDTHS*/
9* ARE *F3.1,* DEGREES, AND THE REST OF THEIR CHARACTERISTICS ARE C
1DESCRIBED ON THE NEXT PAGE.*////)
201 FORMAT (
6H *****,*REPLY WINDOWS*,6H *****//
2* THE FIRST *I1,* INTERROGATORS ARE TRACKED TO DETERMINE AZIMUTH A
3ND TIME WINDOWS WITHIN WHICH AIRCRAFT REPLIES ARE EXAMINED.*//

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4* THE CALCULATION OF THESE WINDOWS ASSUMES A PROTECTED RANGE OF UF
5 TO *F4.0,* NM FROM THE BCAS-EQUIPPED AIRCRAFT.*)
  TMXPRT=2.*CPRCT/C
  IF (NTRACK.LE.9) GO TO 9
  PRINT 109
109  FORMAT (* NTRACK EXCEEDS 9*)
  STOP
9    CONTINUE
  RH1BXD=RH1EXD/3600.
  RH1BYD=RH1EYD/3600.
  RH01RX=RH1EXD+RH1BXD*TIME
  RH01RY=RH1EYD+RH1BYD*TIME
C
C*****  CONVERT BCAS VELOCITY INPUTS FROM KTS TO NM/SEC (ALTITUDE FROM FPM
C*****  TO NM/SEC.
C
  ALTBOT=ALTBOT*FT2NM/60.
  ALTBO=ALTBO*FT2NM
  ALTB=ALTB+ALTBOT*TIME
  CALL PAGE
  PRINT 16
16  FORMAT (T3,*I*,T7,*ID*,T14,*LAT*,T25,*LONG*,T34,*SCAN*,T43,*AZ(0)*
1, T53,*BANG(0)*,T72,*PULSE REPETITION RATE*,T113,*RHO1IX*,T113,
2,*RHO1IY*,T124,*RANGE*/)
  I=1
17  READ 2,INTID(I),(LAT(I,K),K=1,3),(LONG(I,L),L=1,3),ROTRAT(I),
1 (PRP(I,M),M=1,8)
2  FORMAT (I10,1X,3I3,1X,3I3,F10.0,8F5.0)
  IF (INTID(I).EQ.0) GO TO 3
  XLAT1=(33.+55./60.+57./3600.)*DTR
  XLONG1=THOPI-(118.+24./60.+23./3600.)*DTR
  CALL LL2CAR (XLAT1,XLONG1,C.,CAR)
  ANG=HALFPI+XLONG1
  CALL ROTZ (CAR,ANG,AOUT)
  ANG=HALFPI-XLAT1
  CALL ROTX (AOUT,ANG,CAR)
  R1X=CAR(1)
  R1Y=CAR(2)
  XLAT  =(FLOAT(LAT(I,1))+FLOAT(LAT(I,2))/60.+FLOAT(LAT(I,3))/3600.
1)*DTR
  XLONG  =THOPI-(FLOAT(LONG(I,1))+FLOAT(LONG(I,2))/60.+
1FLOAT(LONG(I,3))/3600.)*DTR
  CALL LL2CAR (XLAT,XLONG,0.,CAR)
  ANG=HALFPI+XLONG1
  CALL ROTZ (CAR,ANG,AOUT)
  ANG=HALFPI-XLAT1
  CALL ROTX (AOUT,ANG,CAR)
19  RHO1IX(I)=CAR(1)-R1X
  RHO1IY(I)=CAR(2)-R1Y
  RNGINT=SQRT(RHO1IX(I)**2+RHO1IY(I)**2)
  IF (RNGINT.GE.DISCIN) GO TO 17
  INTRVL(I)=1
  TINSTR(I)=RANF(DUM)*FRAMET
  TIMINT(I)=TINSTR(I)
  LINT(I)=INTID(I)*(2*30)
  AZSTR(I)=RANF(DUM)*360.
  PRINT 18,I,INTID(I),(LAT(I,K),K=1,3),(LONG(I,L),L=1,3),ROTRAT(I),

```



SETUP

74/74 OPT=2

FTN 4.6+433B

03/3J/78 12

```

18 1AZSTRT(I),TINSTR(I),(PRP(I,M),M=1,3),RHO1IX(I),RHO1IY(I),PNGINT
    FORMAT (1X,I2,2X,I3,2X,3I3,1X,1X,3I3,3X,F4.1,3X,2X,F5.1,3X,1X,F8.6
1,1X,8F5.0,2X,F6.1,2X,2X,F6.1,2X,2X,F6.1)
    ROTRAT(I)=ROTRAT(I)*TWOPI/60.
    AZSTRT(I)=AZSTRT(I)*DTR
    IF (PRP(I,2).EQ.C.) GO TO 11
    ISTAG(I)=8
    IF (PRP(I,7).EQ.C.) ISTAG(I)=6
    GO TO 11
10  ISTAG(I)=1
11  IS=ISTAG(I)
    DO 13 M=1,IS
    PRP(I,M)=1./PRP(I,M)
13  CONTINUE
    I=I+1
    IF (I.LE.70) GO TO 17
    PRINT 103
103  FORMAT (//6H *****,* WARNING - INTERROGATOR LIMIT OF 70 HAS BEEN R
1  EACHED.*//)
3    NINTS=I-1
    IF (NINTS.GT.0) GO TO 5
    PRINT 4
4    FORMAT (*1NO INTERROGATORS SPECIFIED.*)
    STOP
5    ACTIME=FLOAT(IACUPD)*FRAMET
    FRAMSC=1999./FRAMET
    BWQVR2=DTR*.5*BMMWDTH
    COSHBW=COS(BWCVR2)
C
C*****  TEMPORARY REDUCTION TO 1 INTERROGATOR (FIRST)
C
    NINTS=1
    CALL BASIN
    XPOW=XPOW*(C/(4.*1090.E+06*PI))**2
    DO 22 J=1,NAC
    RHOJBC(J)=SQRT((RHO1BX-RHO1JX(J))**2+(RHO1BY-RHO1JY(J))**2+
1  (ALTB-ALT(J))**2)
    LAC(J)=J*(2**20)
    MDBPOW(J)=ABS(3000.+1000.*ALOG10(XPOW/(RHOJBC(J)**2)))
    IF(IABS(MDBPOW(J)).GT.(2**20-1))MDBPOW(J)=ISIGN(2**20-1,MDBPOW(J))
    MDAPOW(J)=MDBPOW(J)+LAC(J)
22  CONTINUE
    RETURN
    END

```

REFERENCE MAP (R=1)

N	TYPE	RELOCATION	TIME	2717	ALT	REAL	ARRAY	AIRCRAFT
REAL		BCAS		5	ALTBOT	REAL		BCAS



BASIN

74/74 OPT=2

FTN 4.6+433B

03/30/78 12.

```

SUBROUTINE BASIN
COMMON/AIRCRF/NAC,RH01JX(743),RH01JY(743),ALT(743),RH1JXD(743),
1RH1JYD(743),ALTDOT(743),RH1JX0(743),RH1JY0(743),RNGHOR(743),
2LAC(743),MCBPCW(743),XPOW,ALTD(743),ALTSQ(743)
COMMON/INTER/NINTS,RH01IX(70),RH01IY(70),INTID(70),ROTTRAT(70),
1PRP(70,8),INTRVL(70),LINT(70),AZSTRT(70),ISTAG(70)
COMMON/VECMAG/RHOFCN(768,70)
COMMON/TIME/TIME,TNEXT,FRAMET,ENDTIM,ACTIME,IACUPD,FRAMSC
COMMON/CONST/FT2NM,REARTH,TWO43E,PI,HALFPI,TWOPI,DTR,RTD,C,ONEOVC
DO 5 J=1,NAC
  READ(1,2)RH1JX0(J),RH1JY0(J),ALTD(J),RH1JXD(J),RH1JYD(J),ALTDOT(J)
2  FORMAT (12X,4(1X,E14.7)/2(E14.7,1X))
  READ (1)
  ALTD(J)=ALTD(J)*FT2NM
  ALTDOT(J)=ALTDOT(J)*FT2NM
  ALT(J)=ALTD(J)+ALTDOT(J)*TIME
  ALTSQ(J)=ALT(J)*ALT(J)
  RNGHOR(J)=SQRT(TWO43E*ALT(J))
  RH01JX(J)=RH1JX0(J)+RH1JXD(J)*TIME
  RH01JY(J)=RH1JY0(J)+RH1JYD(J)*TIME
3  DO 5 I=1,NINTS
  RHOFCN(J,I)=1./SQRT((RH01JX(J)-RH01IX(I))**2
1+(RH01JY(J)-RH01IY(I))**2)
5  CONTINUE
  RETURN
  END

```

## REFERENCE MAP (R=1)

TYPE	RELOCATION						
REAL		TIME	2717	ALT	REAL	ARRAY	AIRCRF
REAL	ARRAY	AIRCRF	21326	ALTSQ	REAL	ARRAY	AIRCRF
REAL	ARRAY	AIRCRF	1725	AZSTRT	REAL	ARRAY	INTER
REAL		CONST	6	DTR	REAL		CONST
REAL		TIME	2	FRAMET	REAL		TIME
REAL		TIME	0	FT2NM	REAL		CCNST
REAL		CONST	107	I	INTEGER		
INTEGER		TIME	215	INTID	INTEGER	ARRAY	INTER
INTEGER	ARRAY	INTER	2033	ISTAG	INTEGER	ARRAY	INTER
INTEGER			15040	LAC	INTEGER	ARRAY	AIRCRF
INTEGER	ARRAY	INTER	16407	MCBPCW	INTEGER	ARRAY	AIRCRF
INTEGER		AIRCRF	0	NINTS	INTEGER		INTER
REAL		CONST	3	PI	REAL		CCNST
REAL	ARRAY	INTER	1	REARTH	REAL		CCNST
REAL	ARRAY	VECMAG	1	RH01IX	REAL	ARRAY	INTER
REAL	ARRAY	INTER	1	RH01JX	REAL	ARRAY	AIRCRF
REAL	ARRAY	AIRCRF	4266	RH1JXD	REAL	ARRAY	AIRCRF
REAL	ARRAY	AIRCRF	5635	RH1JYD	REAL	ARRAY	AIRCRF
REAL	ARRAY	AIRCRF	13471	RNGHOR	REAL	ARRAY	AIRCRF
REAL	ARRAY	INTER	7	RTD	REAL		CCNST



```

SUBROUTINE MOVEAC
COMMON/AIRCRF/NAC,RH01JX(743),RH01JY(743),ALT(743),RH1JXD(743),
1RH1JYD(743),ALTDOT(743),RH1JXC(743),RH1JYC(743),RNGHOR(743),
2LAC(743),M0BPOW(743),XPOW,ALTC(743),ALTSQ(743)
COMMON/BCAS/RH01BX,RH01BY,ALTB,RH1BXD,RH1BYD,ALB0T,RH1BXJ,RH1BYJ,
1ALTB0,RH0JBC(768),RH0IBC(70)
COMMON/INTER/NINTS,RH01IX(70),RH01IY(70),INTID(70),ROTRAT(70),
1PRP(70,8),INTRVL(70),LINT(70),A7STRT(70),ISTAG(70)
COMMON/TIME/TIME,TNEXT,FRAMET,ENDTIM,ACTIME,IACUPD,FRAMSC
COMMON/VECMAG/RHOF0CN(768,70)
COMMON/CONST/FT2NM,REARTH,TW043E,PI,HALFPI,TWOPI,DTR,RTD,C,ONEOVC
DO 4 J=1,NAC
  RH01JX(J)=RH1JXC(J)+RH1JXD(J)*TIME
  RH01JY(J)=RH1JYC(J)+RH1JYD(J)*TIME
  IF (ALTDOT(J).EQ.0.) GO TO 3
  ALT(J)=ALT0(J)+ALTDOT(J)*TIME
  ALTSQ(J)=ALT(J)*ALT(J)
  RNGHOR(J)=SQRT(TW043E*ALT(J))
  IF (ALT(J).LE..01) ALTDOT(J)=-ALTDOT(J)
3  CONTINUE
  RH0JBC(J)=SQRT((RH01BX-RH01JX(J))**2+(RH01BY-RH01JY(J))**2+
1  (ALTB-ALT(J))**2)
  M0BPOW(J)=ABS(3000.+1000.*ALOG10(XPOW/(RH0JBC(J)**2)))
  IF (IABS(M0BPOW(J)).GT.(2**20-1)) M0BPOW(J)=ISIGN(2**20-1,M0BPOW(J))
  M0BPOW(J)=M0BPOW(J)+LAC(J)
4  CONTINUE
  DO 5 I=1,NINTS
  DO 5 J=1,NAC
  RHOF0CN(J,I)=1./SQRT((RH01JX(J)-RH01IX(I))**2
1+ (RH01JY(J)-RH01IY(I))**2)
5  CONTINUE
  RETURN
  END

```

## 410 REFERENCE MAP (R=1)

SN	TYPE	RELLOCATION					
	REAL	TIME	2717	ALT	REAL	ARRAY	AIRCRF
	REAL	BCAS	5	ALTB0T	REAL		BCAS
	REAL	PCAS	7204	ALTDOT	REAL	ARRAY	AIRCRF
	REAL	ARRAY AIRCRF	17757	ALT0	REAL	ARRAY	AIRCRF
	REAL	ARRAY INTER	10	C	REAL		CCNST
	REAL	CONST	3	ENDTIM	REAL		TIME
	REAL	TIME	6	FRAMSC	REAL		TIME
	REAL	CONST	4	HALFPI	REAL		CCNST
	INTEGER		5	IACUPD	INTEGER		TIME
	INTEGER	ARRAY INTER	1511	INTRVL	INTEGER	ARRAY	INTER
	INTEGER	ARRAY INTER	117	J	INTEGER		
	INTEGER	ARRAY AIRCRF	1617	LINT	INTEGER	ARRAY	INTER
	INTEGER	ARRAY AIRCRF	0	NAC	INTEGER		AIRCRF



OUTLINE SRTNOW

74/74 OPT=2

FTN 4.6+433B

03/30/7

# SUBROUTINE SRTNOW

```

C
C***** CURRENT FRAME REPLY PRE-SORT
C
COMMON/WINDOW/IWIN,IAZWIN(9),TWNBE(9,3),TWNEND(9,3),TMNPRT(9),
1TMXPRT
COMMON/SORT/SORT(2000),ISORT(2000),SORTNX(2000),ISCRTX(2000)
COMMON/REPLY/REPNOW(1000),NOWIJP(1000),NOWREP,NEXREP,REPTIM,ISAVE
COMMON/TIME/TIME,TNEXT,FRAMET,ENDTIM,ACTIME,IACUPD,FRAMSC
COMMON/INPUT/COSHBW,REPROB,DPROT,BWOVR2,NTRACK
ITRK=0
DO 4 M=1,NTRACK
IF (IAZWIN(M).EQ.0) GO TO 4
IF (TWNBE(M,1).LE.REPTIM.AND.REPTIM.LE.TWNEND(M,1)) GO TO 5
IF (TWNBE(M,2).LE.REPTIM.AND.REPTIM.LE.TWNEND(M,2)) GO TO 5
GO TO 4
5 ITRK=ITRK+1
IF (ITRK.GT.5) GO TO 4
ISAVE=ISAVE.OR.SHIFT(M,36+4*ITRK)
4 CONTINUE
IF (ITRK.EQ.0) RETURN
NOWREP=NOWREP+1
K=(REPTIM-TIME)*FRAMSC+1.
IF (SORT(K).LT.0.) GO TO 2
DO 1 M=1,2000
K=K+1
IF (K.GT.2000) K=1
IF (SORT(K).LT.0.) GO TO 2
1 CONTINUE
PRINT 3
3 FORMAT (* PRESORT ERROR*)
STOP
2 SORT(K)=REPTIM
ISORT(K)=ISAVE
RETURN
END

```

## LIO REFERENCE MAP (R=1)

SV	TYPE	RELLOCATION					
3	REAL	TIME	3	BWOVR2	REAL		INPUT
2	REAL	INPUT	2	DPROT	REAL		INPUT
2	REAL	TIME	2	FRAMET	REAL		TIME
5	REAL	TIME	5	IACUPD	INTEGER		REPLY
3723	INTEGER	WINDOW	3723	ISAVE	INTEGER	ARRAY	SCRT
13560	INTEGER	SOPT	13560	ISORTX	INTEGER		WINDOW
0	INTEGER		0	IWIN	INTEGER		
61	INTEGER		61	M	INTEGER		
1753	INTEGER	REPLY	1753	NOWIJP	INTEGER	ARRAY	REPLY
4	INTEGER	PEPLY	4	NTRACK	INTEGER		INPUT



ROUTINE SORTNEX

```

SUBROUTINE SORTNEX
C
C***** NEXT FRAME REPLY PRE-SORT
C
COMMON/WINDOW/IWIN,IAZWIN(9),TWNBE(9,3),TWNEND(9,3),TMNPRT(9),
1TMXPRT
COMMON/SORT/SCRT(2000),ISORT(2000),SORTNX(2000),ISCRTX(2000)
COMMON/REPLY/REPNOW(1000),NOWIJP(1000),NOWREP,NEXREF,REPTIM,ISAVE
COMMON/TIME/TIME,TNEXT,FRAMET,ENDTIM,ACTIME,IACUPD,FRAMSC
COMMON/INFLT/COSHBW,REPROB,CPROT,BWOVR2,NTRACK
ITRK=0
DO 4 M=1,NTRACK
IF (IAZWIN(M).EQ.0) GO TO 4
IF (TWNBE(M,1).LE.REPTIM.AND.REPTIM.LE.TWNEND(M,1)) GO TO 5
IF (TWNBE(M,2).LE.REPTIM.AND.REPTIM.LE.TWNEND(M,2)) GO TO 5
IF (TWNBE(M,3).LE.REPTIM.AND.REPTIM.LE.TWNEND(M,3)) GO TO 5
GO TO 4
5 ITRK=ITRK+1
IF (ITRK.GT.5) GO TO 4
ISAVE=ISAVE.OR.SHIFT(M,36+4*ITRK)
4 CONTINUE
IF (ITRK.EQ.0) RETURN
NEXREF=NEXREF+1
K=(REPTIM-TIME)*FRAMSC+1.
IF (SORTNX(K).LT.0.) GO TO 2
DO 1 M=1,2000
K=K+1
IF (K.GT.2000) K=1
IF (SORTNX(K).LT.0.) GO TO 2
1 CONTINUE
PRINT 3
3 FORMAT (* PRESORT ERROR*)
STOP
2 SORTNX(K)=REPTIM
ISORTX(K)=ISAVE
RETURN
END

```

APPLIC REFERENCE MAP (R=1)

TE  
NEX

SN	TYPE	RELLOCATION					
TIME	REAL	TIME	3	BWOVR2	REAL		INPUT
REP	REAL	INPUT	2	DPROT	REAL		INPUT
DTIM	REAL	TIME	2	FRAMET	REAL		TIME
FRAMSC	REAL	TIME	5	IACUPD	INTEGER		TIME
IAZWIN	INTEGER	ARRAY WINDOW	3723	ISAVE	INTEGER		REPLY
SCRT	INTEGER	ARRAY SORT	13560	ISORTX	INTEGER	ARRAY	SCRT
IWIN	INTEGER		7	IWIN	INTEGER		WINDOW
REPTIM	INTEGER		64	M	INTEGER		
NOWIJP	INTEGER	REPLY	1750	NOWIJP	INTEGER	ARRAY	REPLY



```

SUBROUTINE CHRONO
COMMON/SORT/SCRT(2000),ISORT(2000),SORTNX(2000),ISCRTX(2000)
COMMON/REPLY/REPNOV(1000),NOWIJP(1000),NOWREP,NEXREP,REPTIM,ISAVE
C
C***** PACK PRE-SORTED ARRAY
C
      K=0
      DO 2 I=1,NOWREP
1       K=K+1
         IF (SORT(K).LT.0.) GO TO 1
         REPNOV(I)=SORT(K)
         NOWIJP(I)=ISORT(K)
2       CONTINUE
C
C***** FINAL BUBBLE SORT
C
      M=NOWREP-1
      IF (M.LE.0) RETURN
      DO 6 L=1,M
      K=NOWREP-L
      SWAP=-1.
      DO 5 I=1,K
         IF (REPNOV(I).LE.REPNOV(I+1)) GO TO 5
         SWAP=REPNOV(I)
         REPNOV(I)=REPNOV(I+1)
         REPNOV(I+1)=SWAP
         ISWAP=NOWIJP(I)
         NOWIJP(I)=NOWIJP(I+1)
         NOWIJP(I+1)=ISWAP
5       CONTINUE
         IF (SWAP) 10,6,6
6       CONTINUE
10      RETURN
      END

```

## CLIC REFERENCE MAP (R=1)

5  
10

SN	TYPE	RELCCATION						
	INTEGER			3723	ISAVE	INTEGER		REPLY
T	INTEGER	ARRAY	SORT	13563	ISORTX	INTEGER	APRAY	SCRT
P	INTEGER			34	K	INTEGER		
	INTEGER			36	M	INTEGER		
SC	INTEGER		REPLY	1750	NOWIJP	INTEGER	ARRAY	REPLY
EC	INTEGER		REPLY	0	REPNOV	REAL	ARRAY	REPLY
IV	REAL		REPLY	0	SORT	REAL	ARRAY	SCRT
RY	REAL	ARRAY	SORT	40	SWAP	REAL		

47LS

0 2  
31 10

26 5



AD-A061 948

FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFIC--ETC F/G 17/7  
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2 OF 5  
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1.0 1.1 1.25 1.4 1.6 1.8 2.0 2.2 2.5 2.8 3.2 3.6 4.0 4.5 5.0 5.6 6.3 7.1 8.0 9.0 10 11 12.5 14 16 18 20 22.5 25 28 32 36 40 45 50 56 63 71 80 90 100

MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A



ROUTINE LL2CAR

74/74 OPT=2

FTN 4.6+4338

03/30.

# SUBROUTINE LL2CAR (RLAT,RLON,H,CAR)

C  
C\*\*\*\*\* THIS SUBROUTINE CONVERTS A POSITION SPECIFIED AS LATITUDE,  
C\*\*\*\*\* LONGITUDE, AND HEIGHT ABOVE A SPHERICAL EARTH TO EARTH-CENTERED  
C\*\*\*\*\* CARTESIAN COORDINATES (X-AXIS ALONG INTERSECTION OF GREENWICH  
C\*\*\*\*\* MERIDIAN WITH EQUATORIAL PLANE, Z-AXIS ALONG NORTH POLAR AXIS,  
C\*\*\*\*\* Y-AXIS COMPLETES RIGHT-HANDED TRIAD).  
C

DIMENSION CAR(3)  
DATA RE/3437.747/  
R=RE+H  
RCLAT=R\*COS(RLAT)  
CAR(1)=RCLAT\*COS(RLON)  
CAR(2)=RCLAT\*SIN(RLON)  
CAR(3)=R\*SIN(RLAT)  
RETURN  
END

## SYMBOLIC REFERENCE MAP (R=1)

NTS  
2CAR

	SN	TYPE	RELLOCATION				
R		REAL	ARRAY	F.P.	0	H	REAL
		REAL			27	RCLAT	REAL
		REAL			0	RLAT	REAL
ON		REAL		F.P.			F.P.

	TYPE	ARGS				
S	REAL	1 LIBRARY		SIN	REAL	1 LIBRARY
S	LENGTH	308	24			



LINE ROTX

74/74 OPT=2

FTN 4.6+433B

03/30/78

SUBROUTINE RCTX (AIN,ANG,AOUT)

```

C
C***** THIS SUBROUTINE COMPUTES THE TRANSFORMATION ACUT OF THE INPUT
C***** COORDINATES AIN BY ROTATING POSITIVELY ABOUT THE X-AXIS THROUGH THE
C***** INPUT ANGLE ANG.
C

```

```

      DIMENSION AIN(3),AOUT(3)
      SANG=SIN(ANG)
      CANG=COS(ANG)
      AOUT(1)=AIN(1)
      AOUT(2)=AIN(2)*CANG + AIN(3)*SANG
      AOUT(3)=AIN(3)*CANG - AIN(2)*SANG
      RETURN
      END

```

TO REFERENCE MAP (R=1)

SN	TYPE	RELOCATION				
	REAL	ARRAY	F.P.	0	ANG	REAL
	REAL	ARRAY	F.P.	22	CANG	REAL
	REAL					
	TYPE	ARGS				
	REAL	1 LIBRARY		SIN	REAL	1 LIBRARY

6TH	238	19
-----	-----	----



SUBROUTINE ROTZ (AIN,ANG,AOUT)

C  
C\*\*\*\*\* THIS SUBROUTINE COMPUTES THE TRANSFORMATION ACUT OF THE INPUT  
C\*\*\*\*\* COORDINATES AIN BY ROTATING POSITIVELY ABOUT THE Z-AXIS THROUGH  
C\*\*\*\*\* INPUT ANGLE ANG.  
C

DIMENSION AIN(3),AOUT(3)  
SANG=SIN(ANG)  
CANG=COS(ANG)  
AOUT(1)=AIN(1)\*CANG + AIN(2)\*SANG  
AOUT(2)=AIN(2)\*CANG - AIN(1)\*SANG  
AOUT(3)=AIN(3)  
RETURN  
END

SYMBOLIC REFERENCE MAP (R=1)

INTS

BTZ

	SN	TYPE	RELCCATION				
IN		REAL	ARRAY	F.P.	0	ANG	REAL
OUT		REAL	ARRAY	F.P.	22	CANG	REAL
ANG		REAL					

	TYPE	ARGS				
IS	REAL	1 LIBRARY		SIN	REAL	1 LIBRARY

IS	LENGTH	238	19
----	--------	-----	----



03/30/77

C  
C\*\*\*\*\* GO TO TOP OF NEXT PAGE

```
C      PRINT 1
1      FORMAT (1H1)
      RETURN
      END
```

CLIC REFERENCE MAP (R=1)

UT MODE  
FMT

ABELS  
FMT

LENGTH 128 10



SUBROUTINE OUTPUT

COMMON/SORT/SCRT(2000),ISORT(2000),SORTNX(2000),ISCRTX(2000)  
COMMON/REPLY/REPNOH(1000),NOWIJP(1000),NOWREP,NEXREF,REPTIM,ISAVE  
COMMON/CONST/FT2NM,REARTH,TWO43E,PI,HALFPI,TWOPI,DTR,RTD,C,ONEOVC  
COMMON/AZ/AZINT

COMMON/INTER/NINTS,RHO1IX(70),RHO1IY(70),INTID(70),ROTRAT(70),  
1 PRP(70,8),INTRVL(70),LINT(70),AZSTRT(70),ISTAG(70)

DIMENSION KTRACK(5)

DATA MASK4 /0000000000000000000178/

DATA MASK10/000000000000000000017779/

DATA MASK20/00000000000000000003777778/

AZOUT=AMOD(AZINT\*RTD,360.)

PRINT 5,NOWREP,AZOUT

5 FORMAT (1H+,I5,\* REPLIES, AZ =\*F6.1)

IF (NOWREP.EQ.0) RETURN

DO 2 I=1,NOWREP

IOUT=SHIFT(NOWIJP(I),-30).AND.MASK10

JOUT=SHIFT(NOWIJP(I),-20).AND.MASK10

PCW=-.01\*FLOAT(NOWIJP(I).AND.MASK20)

PRINT 1,REFNC(I),INTID,IOUT,JOUT,PCW

1 FORMAT (1H ,F10.6,I4,I5,F8.2)

WRITE (10) REPNOH(I),NOWIJP(I)

2 CONTINUE

RETURN

END

LIC REFERENCE MAP (R=1)

II

SN	TYPE	REL	LOCATION					
	REAL		AZ	102	AZOUT	REAL		
T	REAL	ARRAY	INTER	10	C	REAL		CCNST
	REAL		CONST	0	FT2NM	REAL		CCNST
E	REAL		CONST	103	I	INTEGER		
	INTEGER	ARRAY	INTER	1511	INTRVL	INTEGER	ARRAY	INTER
	INTEGER			3723	ISAVE	INTEGER		REPLY
	INTEGER	ARRAY	SORT	13560	ISORTX	INTEGER	ARRAY	SCRT
	INTEGER	ARRAY	INTER	105	JOUT	INTEGER		
V	INTEGER	*UNDEF		1617	LINT	INTEGER	ARRAY	INTER
	INTEGER			47	MASK20	INTEGER		
	INTEGER			3721	NEXREP	INTEGER		REPLY
	INTEGER		INTER	1750	NOWIJP	INTEGER	ARRAY	REPLY
	INTEGER		REPLY	11	ONEOVC	REAL		CCNST
	REAL		CONST	106	PCW	REAL		
	REAL	ARRAY	INTER	1	REARTH	REAL		CCNST
	REAL	ARRAY	REPLY	3722	REPTIM	REAL		REPLY
	REAL	ARRAY	INTER	107	RHO1IY	REAL	ARRAY	INTER
	REAL	ARRAY	INTER	7	RTD	REAL		CCNST
	REAL	ARRAY	SORT	7640	SORTNX	REAL	ARRAY	SORT
	REAL		CONST	2	TWO43E	REAL		CCNST



I	ID	LAT	LONG	SCAN	AZ(°)	RANG(°)	PULSE RE
1	73	33 49 10	118 8 15	13.0	342.2	.001450 415.	0. 0. 0.
2	76	33 55 57	118 24 23	13.0	107.1	.001966 536.	522. 316. 548.
3	92	34 5 45	117 14 12	15.0	2.3	.001134 275.	0. 0. 0.
4	45	34 12 15	118 21 41	15.0	110.0	.000689 375.	0. 0. 0.
5	58	33 39 46	117 42 43	13.0	137.8	.001723 390.	0. 0. 0.
6	79	33 53 4	117 15 34	15.0	299.5	.001332 220.	0. 0. 0.
7	95	34 3 15	117 35 41	13.0	35.5	.001457 300.	0. 0. 0.
8	110	33 44 45	118 20 7	6.0	223.4	.000691 370.	0. 0. 0.
9	111	33 42 0	117 53 0	6.0	356.5	.000209 275.	0. 0. 0.
10	21	32 48 0	112 55 0	15.0	249.8	.002448 275.	0. 0. 0.
11	27	33 3 38	113 9 29	5.0	76.4	.002336 358.	0. 0. 0.
12	33	32 39 0	114 35 0	6.0	310.5	.000327 400.	0. 0. 0.
13	34	32 39 0	114 35 0	6.0	194.7	.002047 268.	0. 0. 0.
14	43	37 10 0	121 54 0	5.0	113.1	.000047 278.	0. 0. 0.
15	46	35 31 0	121 4 0	5.0	338.9	.001913 241.	0. 0. 0.
16	47	37 22 37	120 33 3	15.0	210.6	.000723 410.	0. 0. 0.
17	48	37 22 34	120 33 3	15.0	319.2	.002258 300.	0. 0. 0.
18	49	37 27 0	120 34 0	6.0	142.7	.001242 250.	0. 0. 0.
19	50	35 40 0	117 38 0	15.0	335.2	.002180 395.	0. 0. 0.
20	51	35 40 0	117 40 0	10.0	75.5	.001489 450.	0. 0. 0.
21	52	35 40 0	117 40 0	15.0	167.1	.002220 305.	0. 0. 0.
22	53	37 43 0	121 54 0	6.0	160.8	.001570 220.	0. 0. 0.
23	54	33 18 0	117 22 0	6.0	84.6	.001145 267.	0. 0. 0.
24	55	33 17 0	117 23 0	6.0	212.8	.001909 300.	0. 0. 0.
25	56	33 18 45	117 24 0	6.0	178.2	.001110 267.	0. 0. 0.
26	57	34 52 22	117 54 38	12.0	75.6	.002305 380.	0. 0. 0.
27	59	34 8 8	117 27 28	15.0	55.0	.002080 250.	0. 0. 0.
28	61	36 46 51	119 43 6	13.0	244.0	.002116 420.	0. 0. 0.
29	62	34 36 14	117 22 12	15.0	130.2	.002315 267.	0. 0. 0.
30	63	34 35 0	117 23 0	15.0	101.2	.000632 275.	0. 0. 0.
31	67	37 40 30	122 7 30	20.0	33.7	.000946 300.	0. 0. 0.
32	69	37 40 0	122 7 0	20.0	239.8	.000782 300.	0. 0. 0.
33	73	32 33 52	117 6 43	20.0	183.7	.001626 250.	0. 0. 0.
34	72	36 20 44	119 54 18	12.0	139.1	.000459 300.	0. 0. 0.
35	74	33 47 0	118 3 0	20.0	306.6	.000290 300.	0. 0. 0.
36	75	33 47 0	118 3 0	20.0	260.0	.001775 200.	0. 0. 0.
37	77	33 57 12	118 24 0	13.0	5.7	.001603 405.	0. 0. 0.
38	78	35 59 32	118 26 42	6.0	343.4	.000179 278.	0. 0. 0.
39	85	32 53 11	117 8 45	13.0	139.5	.001057 350.	0. 0. 0.
40	86	36 35 16	121 50 9	15.0	322.9	.001511 395.	0. 0. 0.
41	87	36 35 52	121 52 25	15.0	207.4	.000191 300.	0. 0. 0.
42	88	32 52 33	116 24 51	5.0	206.0	.002270 241.	0. 0. 0.
43	89	37 25 28	122 0 50	15.0	282.4	.000304 375.	0. 0. 0.
44	90	34 11 18	118 55 53	6.0	100.4	.001473 296.	0. 0. 0.
45	91	32 41 0	117 12 0	6.0	84.5	.001132 300.	0. 0. 0.
46	96	34 36 50	118 6 25	15.0	289.6	.001560 270.	0. 0. 0.
47	97	35 23 44	120 21 12	5.0	185.9	.000343 365.	0. 0. 0.
48	98	34 3 16	117 47 18	10.0	266.5	.001584 296.	0. 0. 0.
49	100	34 7 0	119 7 0	15.0	182.6	.001755 436.	350. 447. 548.
50	101	34 6 47	119 7 13	15.0	202.3	.001871 322.	0. 0. 0.
51	105	32 50 0	118 30 0	16.0	174.8	.000770 300.	0. 0. 0.
52	106	32 42 0	117 14 0	15.0	288.2	.002190 300.	0. 0. 0.
53	107	32 42 0	117 14 0	10.0	323.1	.000107 245.	0. 0. 0.
54	108	32 42 0	117 14 0	10.0	307.5	.002136 240.	0. 0. 0.
55	109	33 15 0	119 30 0	15.0	180.5	.001722 360.	0. 0. 0.
56	112	33 42 0	117 50 0	6.0	66.4	.000503 290.	0. 0. 0.
57	116	34 14 0	116 3 0	6.0	308.9	.000745 295.	0. 0. 0.
58	117	34 14 0	116 3 0	15.0	78.8	.000304 218.	0. 0. 0.
59	120	34 35 14	120 35 37	6.0	343.3	.002032 360.	0. 0. 0.
60	121	34 43 42	120 34 31	15.0	207.7	.001339 275.	0. 0. 0.
61	123	34 12 56	118 28 27	15.0	130.4	.001825 280.	0. 0. 0.
62	124	34 12 50	118 28 15	10.0	182.2	.001610 218.	0. 0. 0.



	PULSE REPETITION RATE							RH01IX	RH01IY	RANGE
5.	0.	0.	0.	0.	0.	0.	0.	13.4	-6.8	15.0
6.	522.	316.	548.	525.	432.	346.	443.	0.0	0.0	0.0
5.	0.	0.	0.	0.	0.	0.	0.	58.1	10.1	59.0
5.	0.	0.	0.	0.	0.	0.	0.	2.2	16.3	16.5
0.	0.	0.	0.	0.	0.	0.	0.	34.7	-16.1	38.2
0.	0.	0.	0.	0.	0.	0.	0.	57.1	-2.6	57.2
0.	0.	0.	0.	0.	0.	0.	0.	40.3	7.5	41.0
0.	0.	0.	0.	0.	0.	0.	0.	3.5	-11.2	11.7
5.	0.	0.	0.	0.	0.	0.	0.	28.6	-13.9	31.8
5.	0.	0.	0.	0.	0.	0.	0.	276.4	-60.5	283.0
58.	0.	0.	0.	0.	0.	0.	0.	263.5	-45.6	267.5
0.	0.	0.	0.	0.	0.	0.	0.	193.0	-73.3	206.5
58.	0.	0.	0.	0.	0.	0.	0.	193.0	-73.3	206.5
0.	0.	0.	0.	0.	0.	0.	0.	-166.9	196.8	258.1
41.	0.	0.	0.	0.	0.	0.	0.	-129.3	96.7	161.9
0.	0.	0.	0.	0.	0.	0.	0.	-102.2	207.6	231.4
0.	0.	0.	0.	0.	0.	0.	0.	-102.2	207.6	231.4
0.	0.	0.	0.	0.	0.	0.	0.	-102.9	212.0	235.6
95.	0.	0.	0.	0.	0.	0.	0.	37.7	104.2	110.8
0.	0.	0.	0.	0.	0.	0.	0.	36.1	104.2	110.2
0.	0.	0.	0.	0.	0.	0.	0.	36.1	104.2	110.2
20.	0.	0.	0.	0.	0.	0.	0.	-165.7	229.7	283.2
67.	0.	0.	0.	0.	0.	0.	0.	52.1	-37.7	64.3
0.	0.	0.	0.	0.	0.	0.	0.	51.3	-38.7	64.3
67.	0.	0.	0.	0.	0.	0.	0.	50.5	-37.0	62.5
80.	0.	0.	0.	0.	0.	0.	0.	24.4	56.5	61.5
50.	0.	0.	0.	0.	0.	0.	0.	47.1	12.4	48.7
20.	0.	0.	0.	0.	0.	0.	0.	-63.0	171.2	182.5
67.	0.	0.	0.	0.	0.	0.	0.	51.2	40.5	65.3
75.	0.	0.	0.	0.	0.	0.	0.	50.5	39.3	64.0
0.	0.	0.	0.	0.	0.	0.	0.	-176.5	227.6	288.0
0.	0.	0.	0.	0.	0.	0.	0.	-176.1	227.1	287.4
50.	0.	0.	0.	0.	0.	0.	0.	65.5	-81.7	104.7
0.	0.	0.	0.	0.	0.	0.	0.	-72.4	145.3	162.3
0.	0.	0.	0.	0.	0.	0.	0.	17.8	-8.9	19.9
0.	0.	0.	0.	0.	0.	0.	0.	17.8	-8.9	19.9
5.	0.	0.	0.	0.	0.	0.	0.	.3	1.3	1.3
76.	0.	0.	0.	0.	0.	0.	0.	-1.9	123.6	123.6
50.	0.	0.	0.	0.	0.	0.	0.	63.5	-62.4	89.0
95.	0.	0.	0.	0.	0.	0.	0.	-165.1	162.0	231.3
0.	0.	0.	0.	0.	0.	0.	0.	-166.9	162.7	233.1
41.	0.	0.	0.	0.	0.	0.	0.	100.4	-62.4	118.2
75.	0.	0.	0.	0.	0.	0.	0.	-171.8	212.4	273.2
96.	0.	0.	0.	0.	0.	0.	0.	-26.1	15.4	30.3
0.	0.	0.	0.	0.	0.	0.	0.	60.9	-74.6	96.3
70.	0.	0.	0.	0.	0.	0.	0.	14.8	40.9	43.5
65.	0.	0.	0.	0.	0.	0.	0.	-95.2	88.7	130.1
96.	0.	0.	0.	0.	0.	0.	0.	30.7	7.4	31.6
36.	350.	447.	542.	525.	320.	554.	530.	-35.3	11.2	37.0
22.	0.	0.	0.	0.	0.	0.	0.	-35.5	11.0	37.1
0.	0.	0.	0.	0.	0.	0.	0.	-4.7	-65.9	66.1
0.	0.	0.	0.	0.	0.	0.	0.	59.2	-73.6	94.5
45.	0.	0.	0.	0.	0.	0.	0.	59.2	-73.6	94.5
43.	0.	0.	0.	0.	0.	0.	0.	59.2	-73.6	94.5
60.	0.	0.	0.	0.	0.	0.	0.	-54.9	-40.7	68.3
20.	0.	0.	0.	0.	0.	0.	0.	28.6	-13.9	31.8
95.	0.	0.	0.	0.	0.	0.	0.	116.9	19.4	118.5
218.	0.	0.	0.	0.	0.	0.	0.	116.9	19.4	118.5
360.	0.	0.	0.	0.	0.	0.	0.	-108.0	40.4	115.3
275.	0.	0.	0.	0.	0.	0.	0.	-106.9	48.9	117.6



62	124	34	12	5	110	28	15	10.0	182.2	.001610	218.	0.	0.
63	421	36	19	8	115	34	27	5.0	139.4	.002218	360.	0.	0.
64	425	37	8	0	114	6	0	15.0	317.1	.001911	287.	0.	0.
65	430	36	34	0	115	38	0	15.0	26.9	.000323	287.	0.	0.
66	431	36	5	5	115	9	32	15.0	330.0	.001912	400.	0.	0.
67	433	36	35	12	115	20	15	6.0	182.5	.001912	300.	0.	0.
68	435	36	15	0	115	2	0	15.0	342.9	.001304	275.	0.	0.
69	438	37	46	0	116	38	0	15.0	330.5	.002393	287.	0.	0.
70	439	38	8	30	117	11	58	5.0	115.8	.001878	241.	0.	0.

\*\*\*\*\* WARNING - INTERROGATOR LIMIT OF 70 HAS BEEN REACHED.

5 REPLIES, AZ = 129.6 73 1.8875000 1.8900000 1.8881973 WIN 1.8883

1.888334****	500	-65.20
1.888339****	22	-65.16
1.888376****	190	-64.68
1.888401****	296	-65.08
1.888403****	145	-65.05

6 REPLIES, AZ = 129.6 73 1.8900000 1.8925000 1.8906169 WIN 1.8907

1.890737****	623	-65.54
1.890747****	500	-65.20
1.890749****	22	-65.16
1.890745****	190	-64.68
1.890811****	296	-65.08
1.890812****	145	-65.05

6 REPLIES, AZ = 129.8 73 1.8925000 1.8950000 1.8930165 WIN 1.8931

1.893147****	623	-65.54
1.893153****	500	-65.20
1.893158****	22	-65.16
1.893165****	190	-64.68
1.893220****	296	-65.08
1.893222****	145	-65.05

6 REPLIES, AZ = 130.0 73 1.8950000 1.8975000 1.8954262 WIN 1.8955

1.895556****	623	-65.54
1.895563****	500	-65.20
1.895568****	22	-65.16
1.895604****	190	-64.68
1.895630****	296	-65.08
1.895632****	145	-65.05

5 REPLIES, AZ = 130.2 73 1.8975000 1.9000000 1.8978358 WIN 1.8979

1.897966****	623	-65.54
1.897972****	500	-65.20
1.898014****	190	-64.68
1.898041****	296	-65.08
1.898041****	145	-65.05

5 REPLIES, AZ = 130.4 73 1.9000000 1.9025000 1.9002455 WIN 1.9003

1.900376****	623	-65.54
1.900382****	500	-65.20
1.900424****	190	-64.68
1.900449****	296	-65.08
1.900451****	145	-65.05

5 REPLIES, AZ = 130.6 73 1.9025000 1.9050000 1.9026551 WIN 1.9027

1.902785****	623	-65.54
1.902792****	500	-65.20
1.902833****	190	-64.68
1.902859****	296	-65.08



280.	0.	0.	0.	0.	0.	0.	0.	0.	17.0	17.3
218.	0.	0.	0.	0.	0.	0.	0.	-3.2	16.9	17.2
360.	0.	0.	0.	0.	0.	0.	0.	136.9	145.0	199.4
287.	0.	0.	0.	0.	0.	0.	0.	205.8	196.3	284.4
287.	0.	0.	0.	0.	0.	0.	0.	133.6	159.8	208.3
400.	0.	0.	0.	0.	0.	0.	0.	157.4	131.6	205.1
300.	0.	0.	0.	0.	0.	0.	0.	147.8	161.4	218.8
275.	0.	0.	0.	0.	0.	0.	0.	163.1	141.7	216.1
287.	0.	0.	0.	0.	0.	0.	0.	34.1	230.6	245.5
241.	0.	0.	0.	0.	0.	0.	0.	57.1	252.7	259.0

4973 WIN 1.888315 1.888562 1.890725 1.890972 1.893134 1.893381

4069 WIN 1.890725 1.890972 1.893134 1.893381 1.895544 1.895791

1165 WIN 1.893134 1.893381 1.895544 1.895791 1.897953 1.898201

9262 WIN 1.895544 1.895791 1.897953 1.898201 1.900363 1.900610

8393 WIN 1.897953 1.898201 1.900363 1.900610 1.902773 1.903020

2455 WIN 1.900363 1.900610 1.902773 1.903020 1.905182 1.905429

6551 WIN 1.902773 1.903020 1.905182 1.905429 1.907592 1.907839



INTERROGATOR NO. 58. BCAS ON 18.-DEGREE LAX RADIAL AT A RANGE OF 20. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 25.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 18.-DEGREE LAX RADIAL AT A RANGE OF 30. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 18.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 180.-DEGREE LAX RADIAL AT A RANGE OF 40. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 11.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 180.-DEGREE LAX RADIAL AT A RANGE OF 50. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 7.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 180.-DEGREE LAX RADIAL AT A RANGE OF 60. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 2.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 27.-DEGREE LAX RADIAL AT A RANGE OF 10. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 25.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 270.-DEGREE LAX RADIAL AT A RANGE OF 20. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 26.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 270.-DEGREE LAX RADIAL AT A RANGE OF 30. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 28.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 27.-DEGREE LAX RADIAL AT A RANGE OF 40. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 32.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 27.-DEGREE LAX RADIAL AT A RANGE OF 50. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 35.0 AVERAG

INTERROGATOR NO. 58. BCAS ON 270.-DEGREE LAX RADIAL AT A RANGE OF 60. NM.  
 GARBLE SUMMARY THIS POSITION - MIN = 0.0 MAX = 35.0 AVERAG



DAD MAP - STAT

CYBER LOADER 1.0-410

147.1

PEX.SQ	21603	14	SL-SYSIO	11/12/78 COMPASS	3. 3-433
PUT.PT/	21617	11			
EQ.RM	21631	42	SL-SYSIO	11/12/78 COMPASS	3. 3-433
CF.SQ	20672	134	SL-SYSIO	11/12/78 COMPASS	3. 3-433
CLSV.FO/	21126	7			
CV.SQ	21135	137	SL-SYSIO	11/12/78 COMPASS	3. 3-433
FW.FO/	21174	7			
EW.SQ	21203	33	SL-SYSIO	11/12/78 COMPASS	3. 3-433
FT.FO/	21236	7			
PAR.XX/	21245	1			
ET.PT/	21246	11			
ET.SQ	21257	1060	SL-SYSIO	11/12/78 COMPASS	3. 3-433
SO	22337	111	SL-SYSIO	11/12/78 COMPASS	3. 3-433
SO	22440	50	SL-SYSIO	11/12/78 COMPASS	3. 3-433
EU.SQ	22510	106	SL-SYSIO	11/12/78 COMPASS	3. 3-433

.32 CP SECONDS

352.8 CM STORAGE USED

33 TABL

CR NO. 58. BCAS ON 0.-DEGREE LAX RADIAL AT A RANGE OF 10. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 9.2
MAX = 24.0	
CR NO. 58. BCAS ON 0.-DEGREE LAX RADIAL AT A RANGE OF 20. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 9.8
MAX = 25.0	
CR NO. 58. BCAS ON 0.-DEGREE LAX RADIAL AT A RANGE OF 30. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 11.7
MAX = 24.0	
CR NO. 58. BCAS ON 0.-DEGREE LAX RADIAL AT A RANGE OF 40. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 10.6
MAX = 26.0	
CR NO. 58. BCAS ON 0.-DEGREE LAX RADIAL AT A RANGE OF 50. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 11.6
MAX = 27.0	
CR NO. 58. BCAS ON 0.-DEGREE LAX RADIAL AT A RANGE OF 60. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 11.8
MAX = 25.0	
CR NO. 58. BCAS ON 90.-DEGREE LAX RADIAL AT A RANGE OF 10. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 4.6
MAX = 14.0	
CR NO. 58. BCAS ON 90.-DEGREE LAX RADIAL AT A RANGE OF 20. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 2.6
MAX = 10.0	
CR NO. 58. BCAS ON 90.-DEGREE LAX RADIAL AT A RANGE OF 30. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 1.6
MAX = 8.0	
CR NO. 58. BCAS ON 90.-DEGREE LAX RADIAL AT A RANGE OF 40. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 1.5
MAX = 9.0	
CR NO. 58. BCAS ON 90.-DEGREE LAX RADIAL AT A RANGE OF 50. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 1.6
MAX = 11.0	
CR NO. 58. BCAS ON 90.-DEGREE LAX RADIAL AT A RANGE OF 60. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 2.0
MAX = 14.0	
CR NO. 58. BCAS ON 130.-DEGREE LAX RADIAL AT A RANGE OF 10. NM.	
MARY THIS POSITION - MIN = 0.0	AVERAGE = 8.0
MAX = 25.0	

A-100



## APPENDIX B

### BCAS MODE SELECTION

Over 100 modes of BCAS have been analyzed using the simulation tool described in Appendix E. Candidate modes of operation were selected based on the criteria of:

- Accuracy better than 825 feet
- ATCRBS/DABS/ATARS/ATC compatibility
- Ability to work everywhere and under all conditions

The initial selection of candidate modes was then configured as a preliminary system concept and is illustrated in Figure B-1. It should be noted that not all modes meet the required position accuracy of 825 feet but are the best available to satisfy the additional compatibility and operational criteria without adding special features to BCAS.

It should be further noted that options for additional features such as a directional antenna, synchro-DABS, azimuth echo and operation with unmodified ATCRBS sites appear in this figure.



The recommended concept, which uses a directional antenna and requires synchro-DABS with azimuth echo whenever the DABS all-call lockout bit is set, was formulated to eliminate modes with poor accuracy and to provide operational capability in high density airspace. Even in this case, a few modes exist, particularly in singular regions, where the accuracy requirement cannot be met. The penalty in these regions for reduced accuracy is a higher false alarm rate and missed alarm rate but represents a graceful degradation in system performance.



FOR

FIGURE B-1

BCAS MODE SELECTION AND CONTROL LOGIC  
(DETAILED FLOW)

(SEE DRAWING)



## APPENDIX C

### TRAFFIC MODELS AND AIRCRAFT DENSITIES

A traffic model was required for the technical analysis of the various BCAS modes. The L.A. Basin was used for modeling purposes since it represents both the region of highest aircraft density, and the largest area of continuous high density. Therefore, the Basin represents the pacing terminal area for BCAS design. Several traffic forecast models for the L.A. Basin in 1982 and beyond were studied (References C-1 and C-2. A model (Reference C-1) based on an actual traffic "snapshot" in 1972 and projected into 1982 was used as the baseline for comparison

This "full 1982" model of 743 aircraft in a 120 by 120 nmi square area centered at the L.A. airport was then reduced by roughly half to 382 aircraft by randomly deselecting aircraft to produce a "half density" model. This was performed again to produce a quarter density model of 177 aircraft, so that interim measurements and analyses could be accomplished. Examples of the traffic distribution for each model are illustrated in Figures C-1, C-2, and C-3. The quarter density model



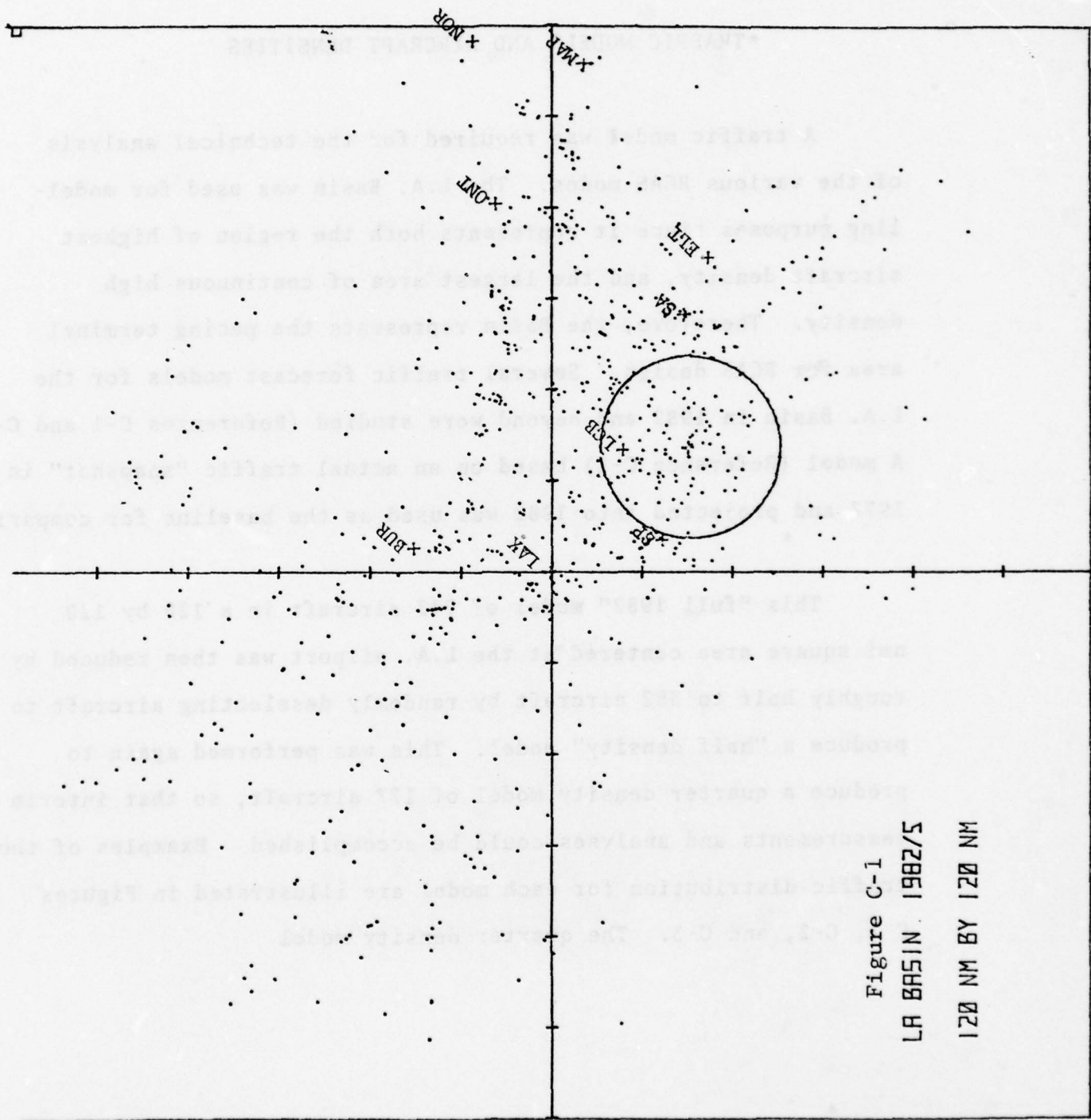


Figure C-1  
 LA BASIN, 1982/5  
 120 NM BY 120 NM



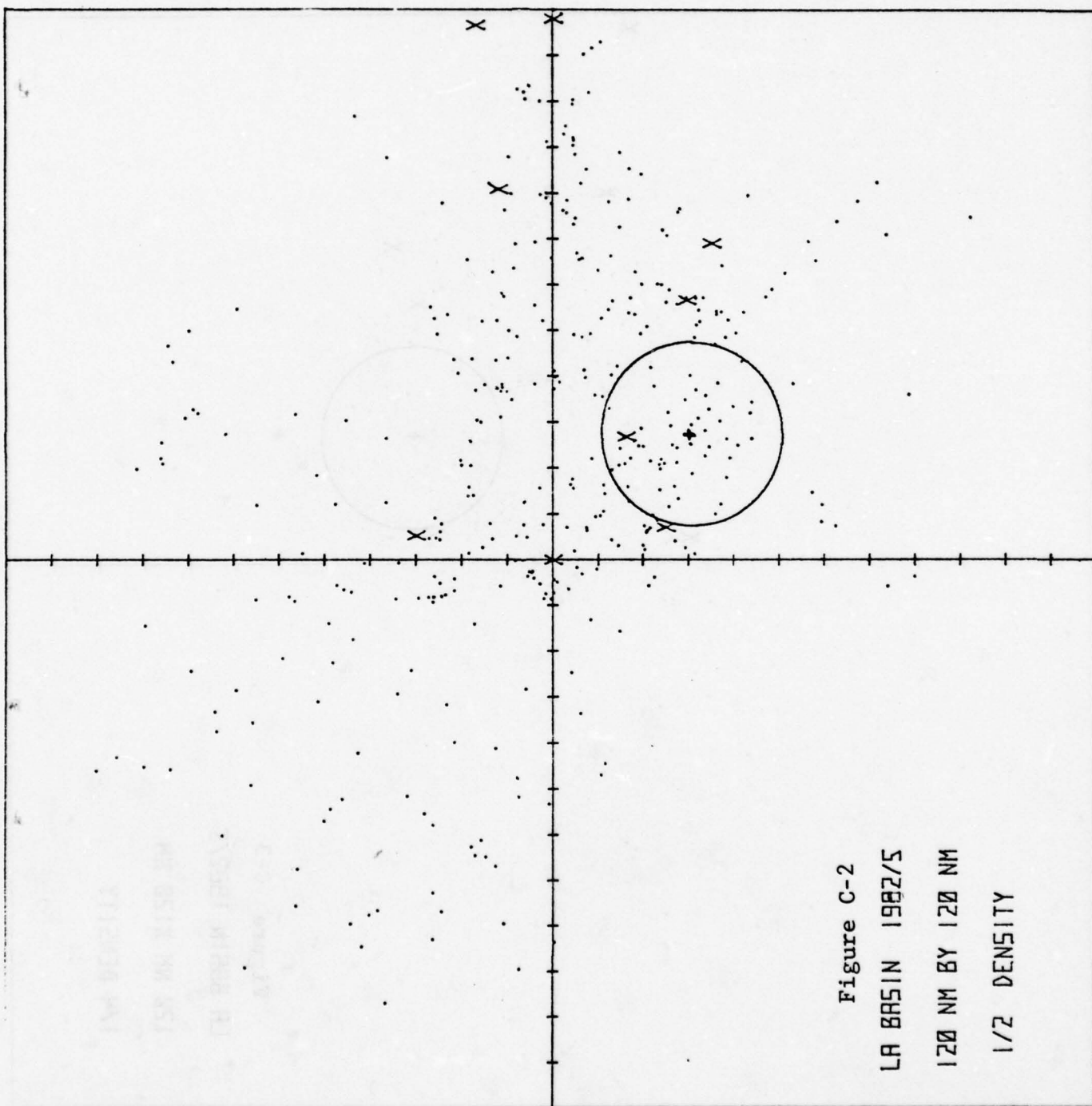


Figure C-2  
 LA BASIN 1982/5  
 120 NM BY 120 NM  
 1/2 DENSITY



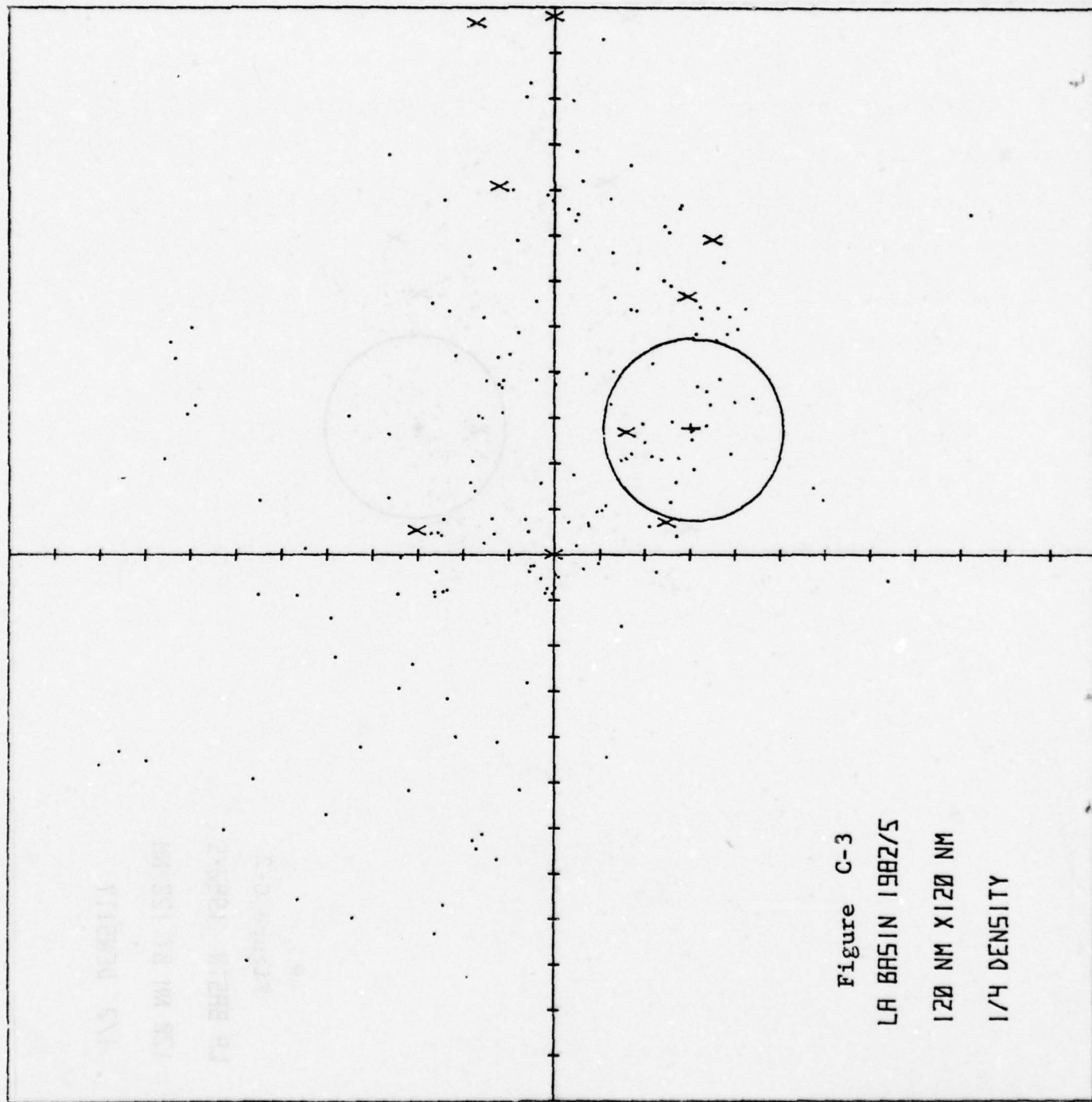


Figure C-3  
LA BASIN 1982/5  
120 NM X 120 NM  
1/4 DENSITY

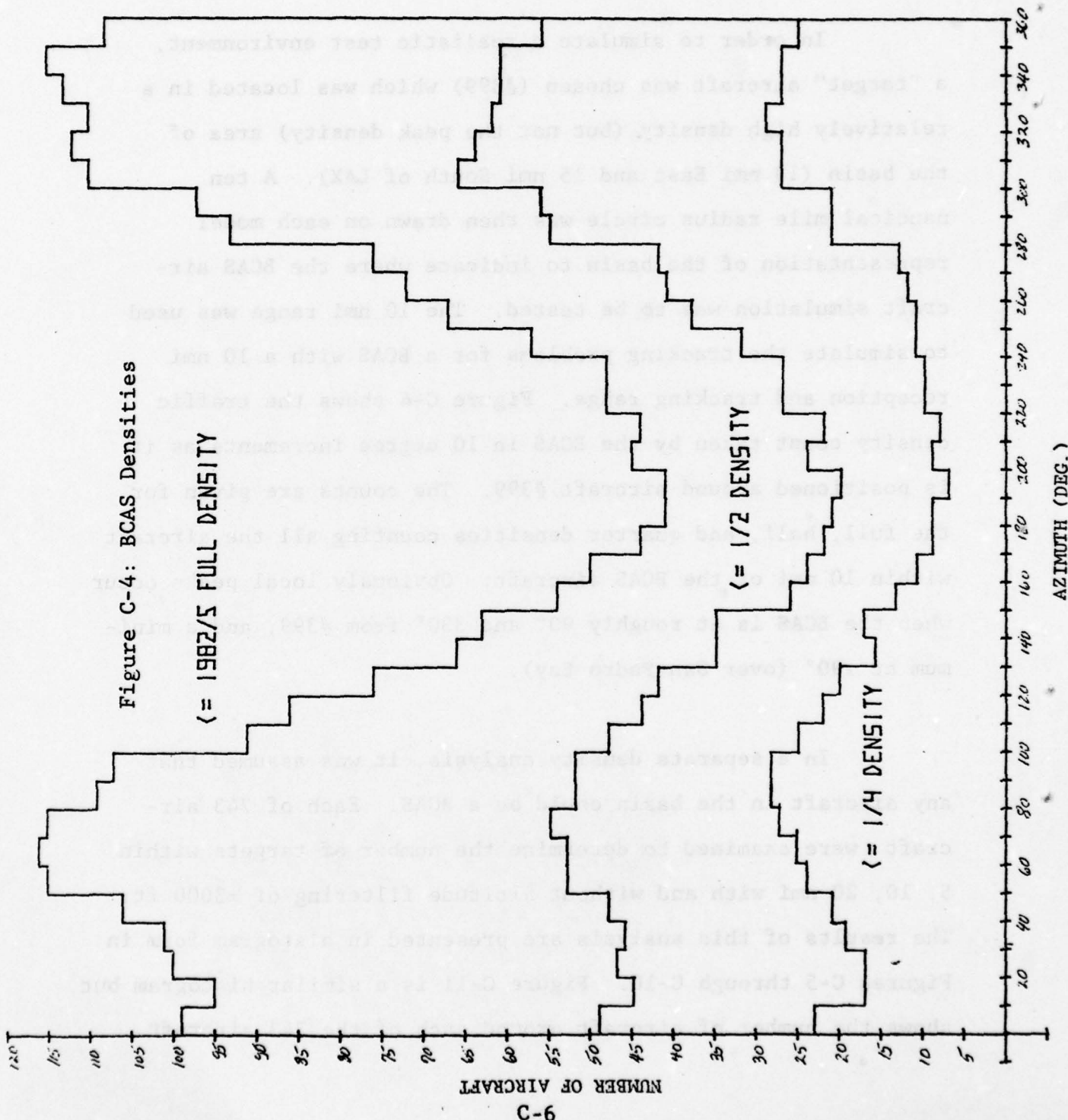


of 177 aircraft is not significantly different from the 1975 beacon-only peak traffic count of 150 aircraft.

In order to simulate a realistic test environment, a "target" aircraft was chosen (#399) which was located in a relatively high density (but not the peak density) area of the basin (13 nmi East and 15 nmi South of LAX). A ten nautical mile radius circle was then drawn on each model representation of the basin to indicate where the BCAS aircraft simulation was to be tested. The 10 nmi range was used to simulate the tracking problems for a BCAS with a 10 nmi reception and tracking range. Figure C-4 shows the traffic density count taken by the BCAS in 10 degree increments as it is positioned around aircraft #399. The counts are given for the full, half, and quarter densities counting all the aircraft within 10 nmi of the BCAS aircraft. Obviously local peaks occur when the BCAS is at roughly 90° and 330° from #399, and a minimum at 190° (over San Pedro Bay).

In a separate density analysis, it was assumed that any aircraft in the basin could be a BCAS. Each of 743 aircraft were examined to determine the number of targets within 5, 10, 20 nmi with and without altitude filtering of  $\pm 3000$  ft. The results of this analysis are presented in histogram form in Figures C-5 through C-10. Figure C-11 is a similar histogram but shows the number of aircraft around each of the 743 aircraft







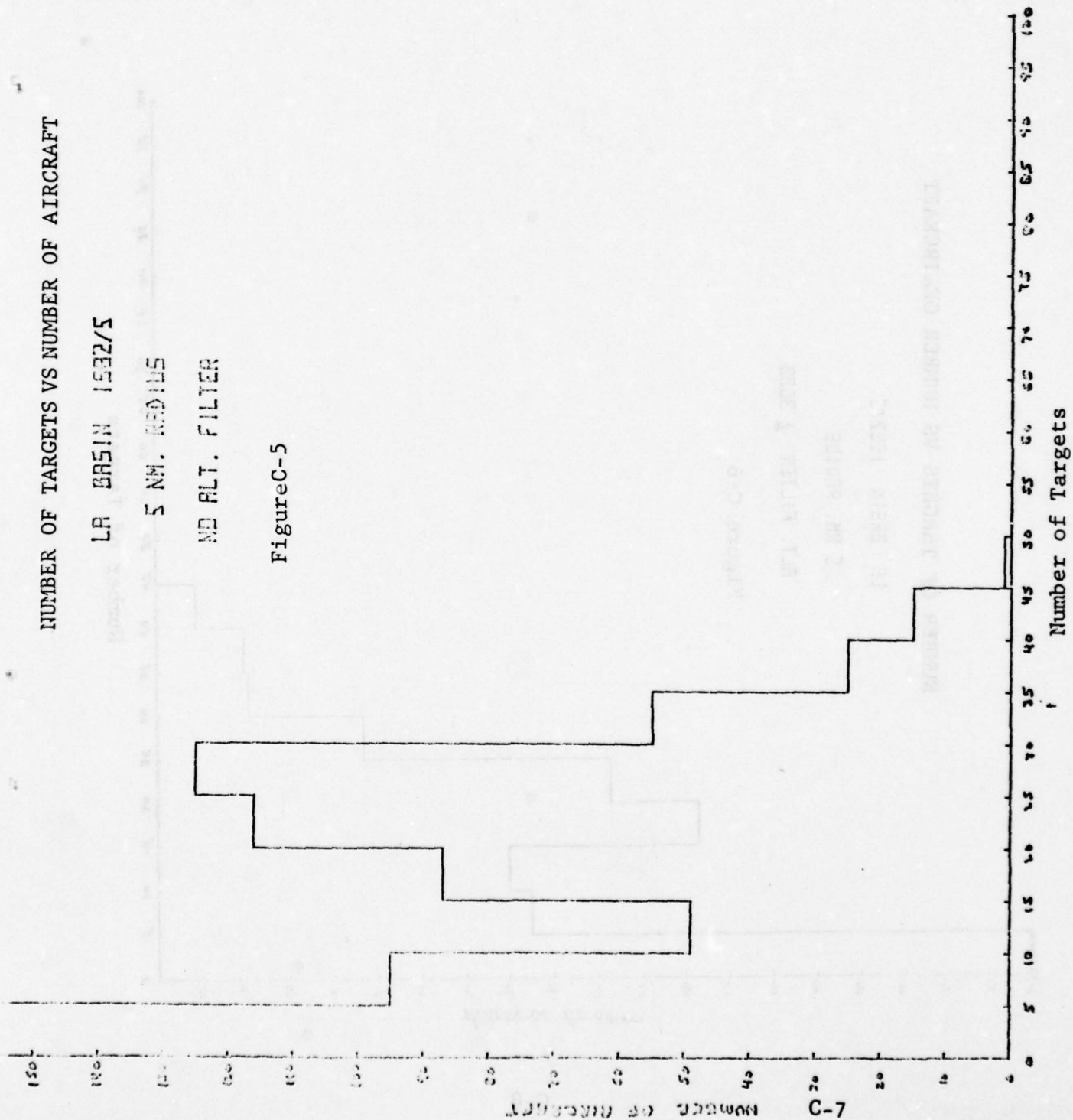
# NUMBER OF TARGETS VS NUMBER OF AIRCRAFT

LA BR51N 1532/5

5 NM. RADARS

NO FLT. FILTER

FigureC-5



C-7



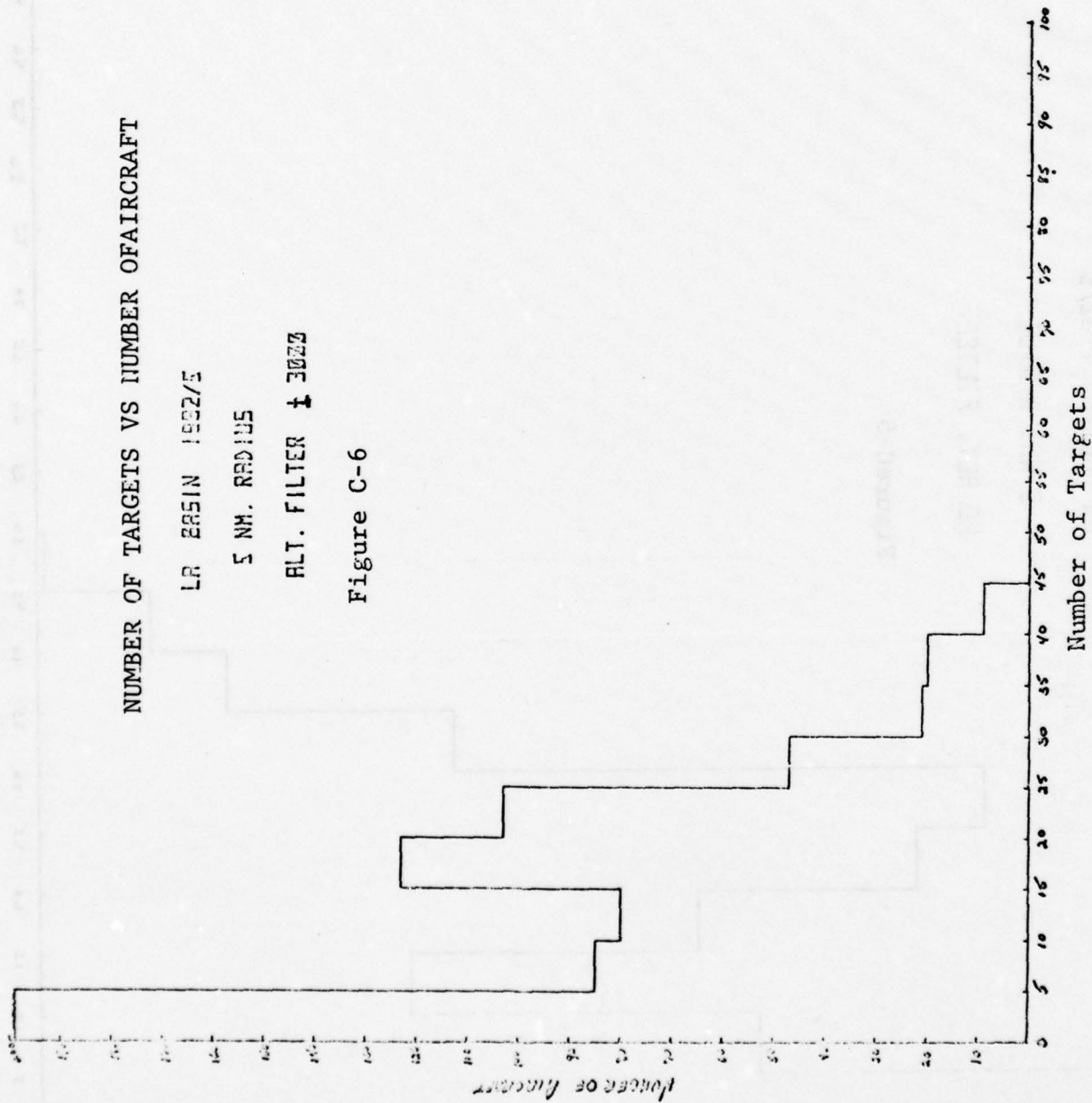
# NUMBER OF TARGETS VS NUMBER OF AIRCRAFT

LR 285IN 1992/5

5 NM. RADIIUS

ALT. FILTER  $\pm 3023$

Figure C-6





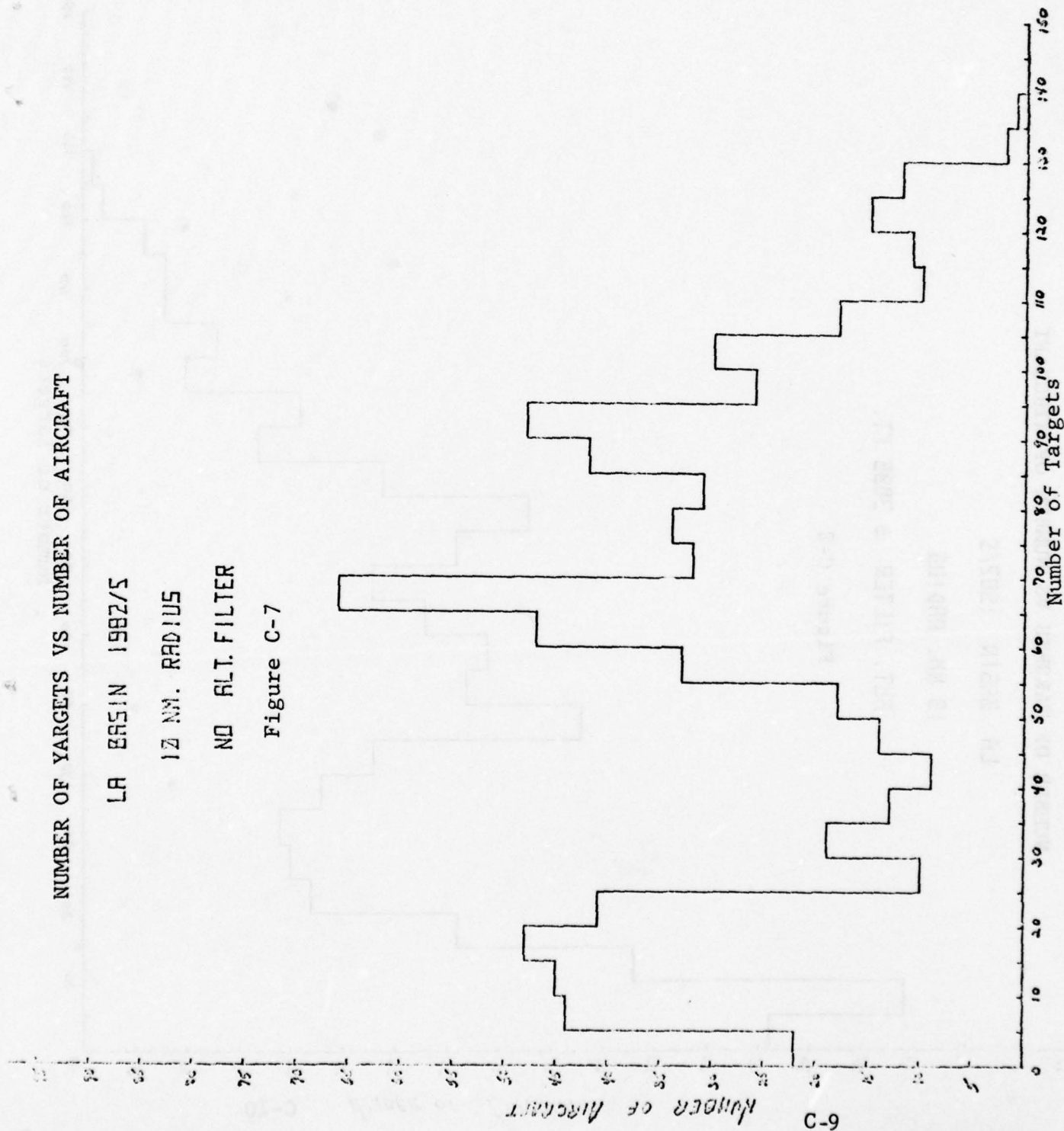
# NUMBER OF YARGETS VS NUMBER OF AIRCRAFT

LA BR51N 1982/5

12 NM. RADIUS

NO ALT. FILTER

Figure C-7





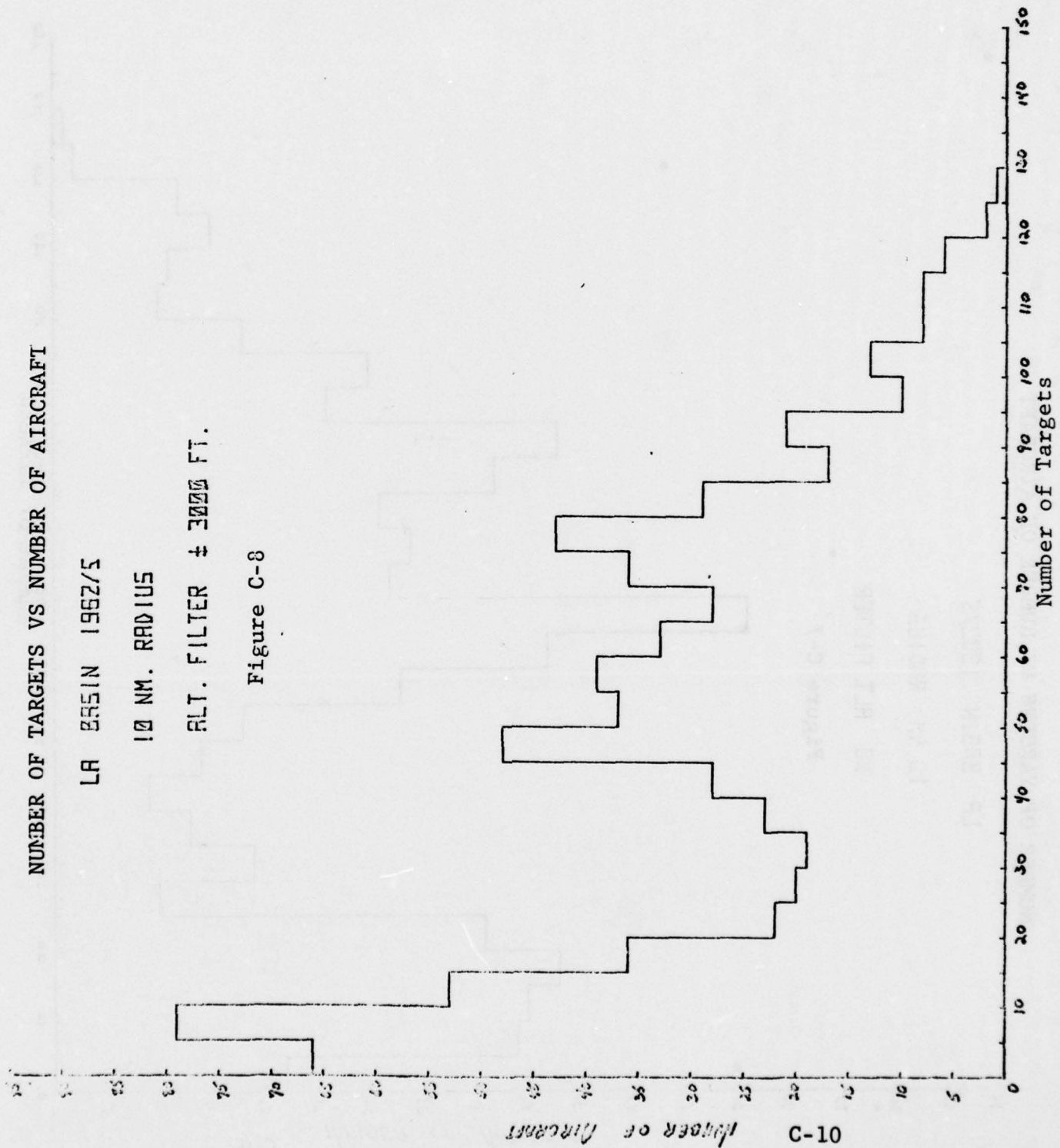
# NUMBER OF TARGETS VS NUMBER OF AIRCRAFT

LA BRSIN 1962/5

10 NM. RADIUS

ALT. FILTER  $\pm 3000$  FT.

Figure C-8



C-10



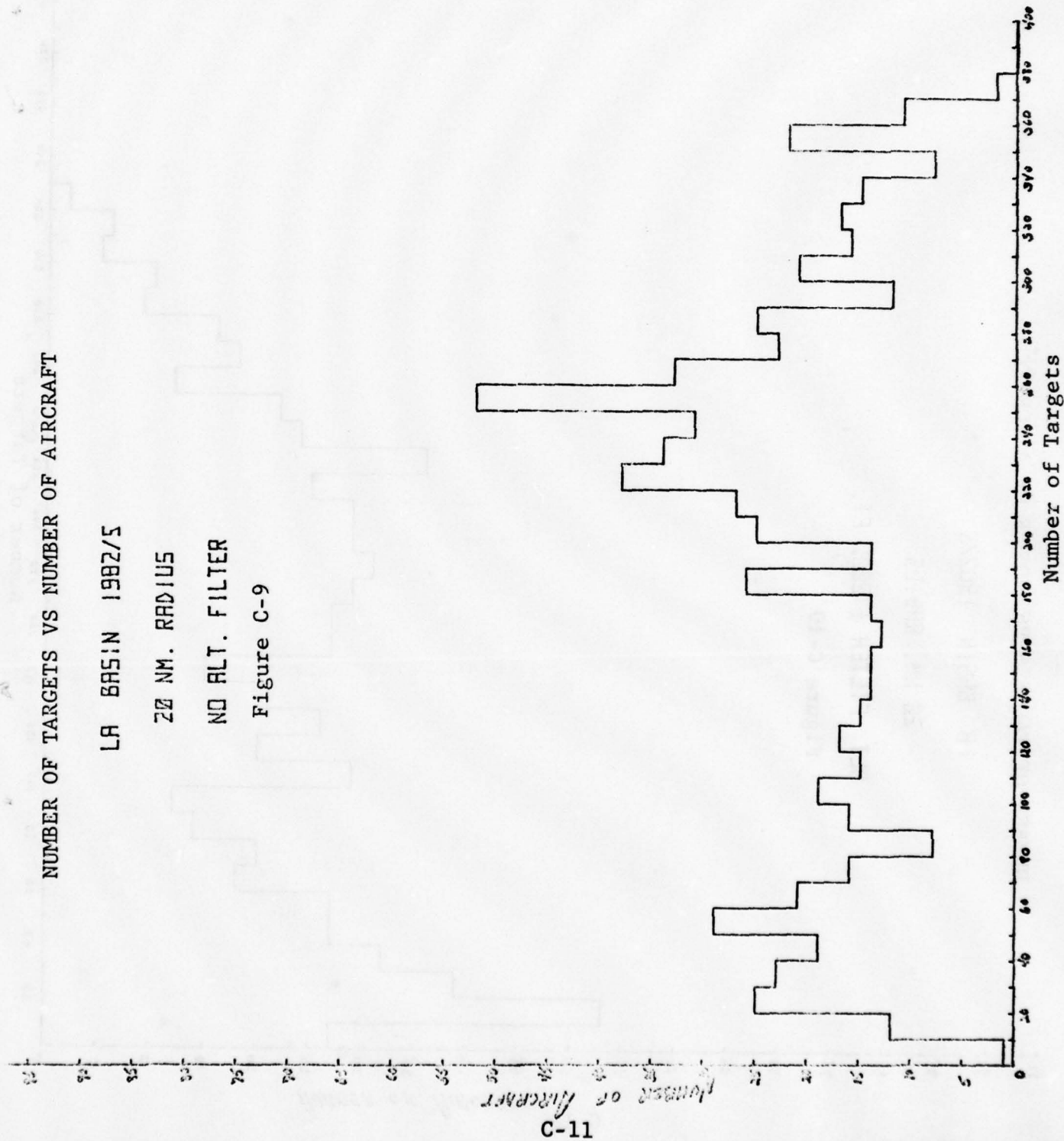
# NUMBER OF TARGETS VS NUMBER OF AIRCRAFT

LA BASIN 1982/5

20 NM. RADIUS

NO ALT. FILTER

Figure C-9





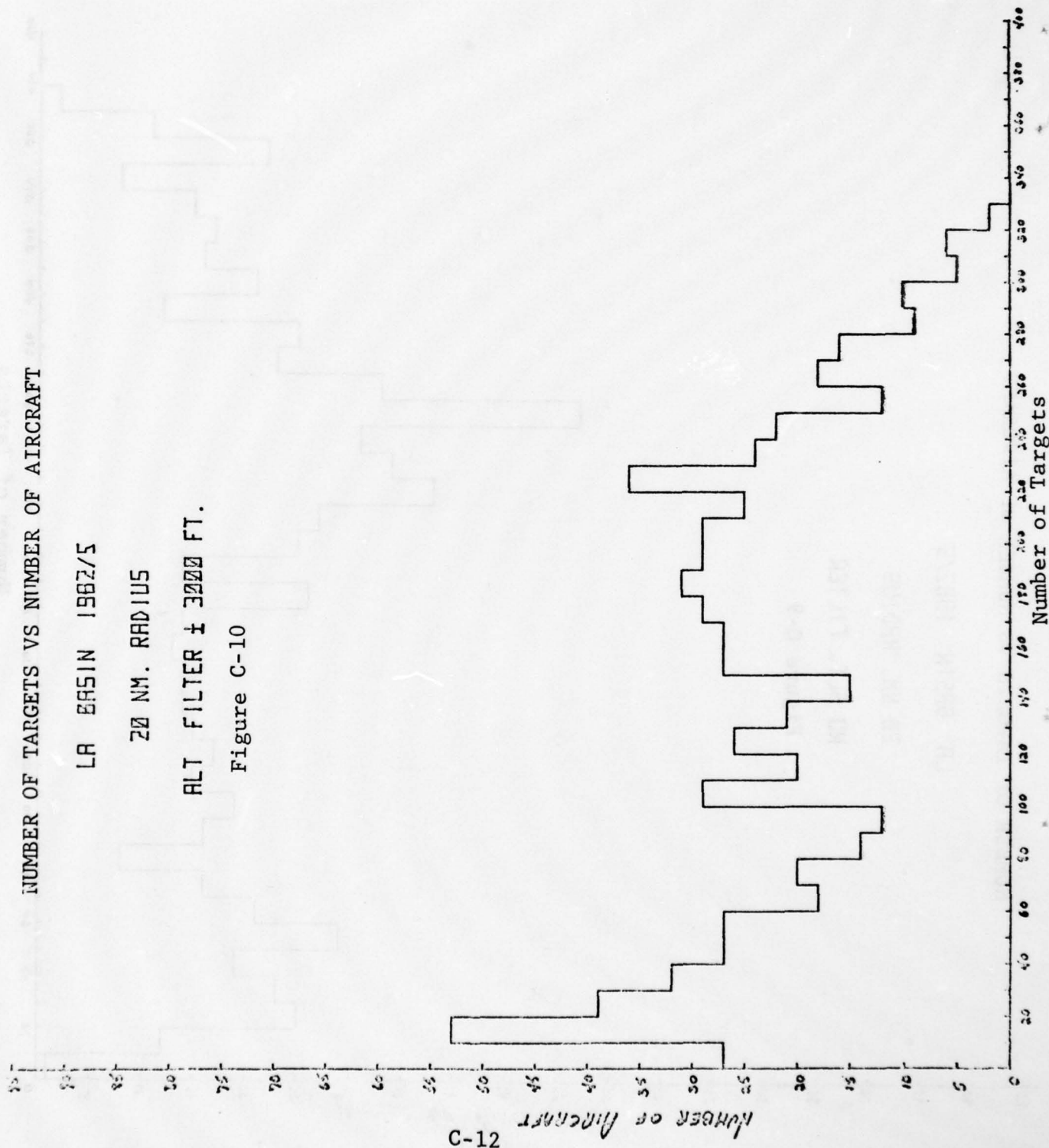
# NUMBER OF TARGETS VS NUMBER OF AIRCRAFT

LA BASIN 1962/5

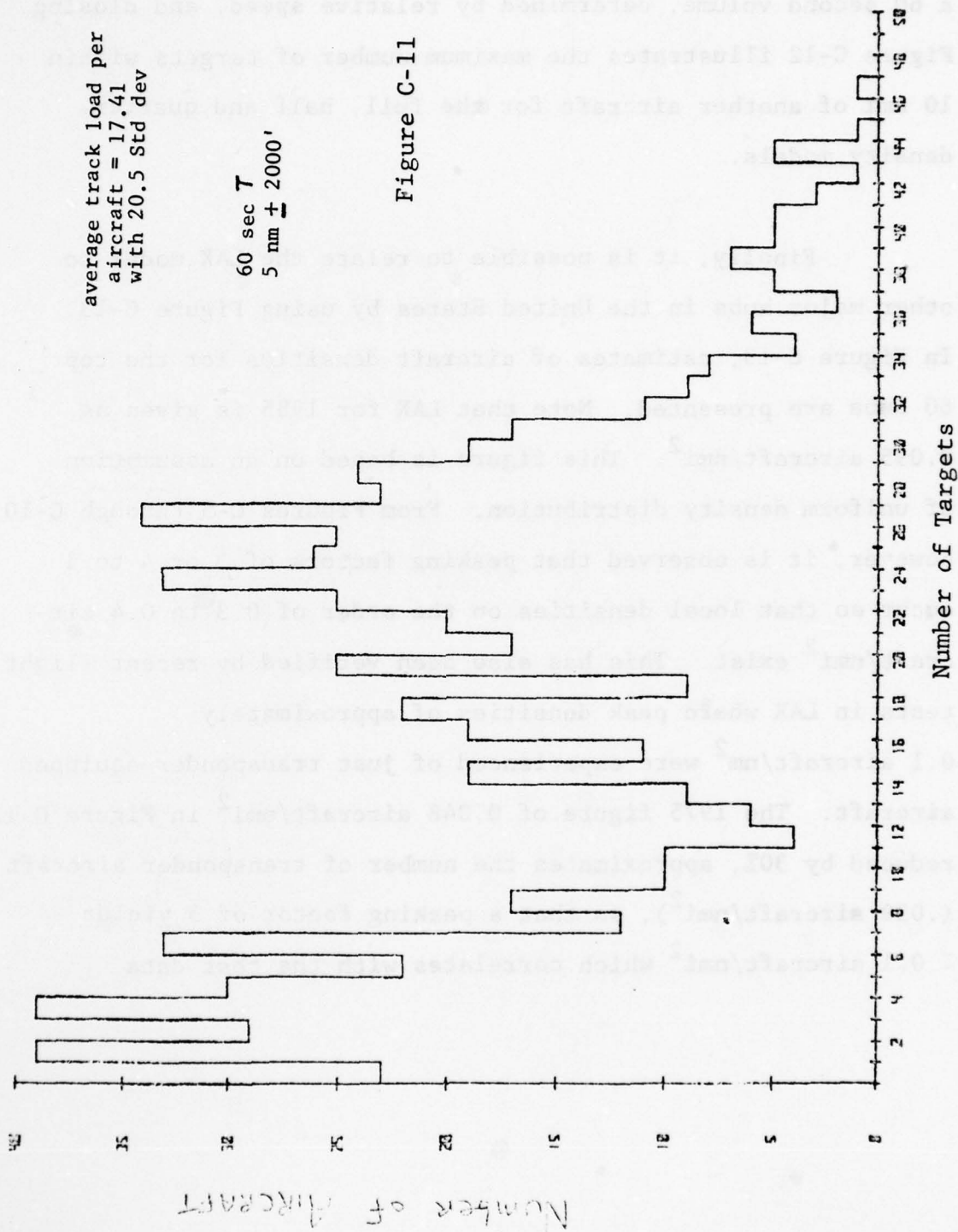
20 NM. RADIUS

ALT FILTER  $\pm 3000$  FT.

Figure C-10









in the L.A. Basin within 5 nmi and  $\pm 2000$  ft and all others within a 60 second volume, determined by relative speed, and closing. Figure C-12 illustrates the maximum number of targets within 10 nmi of another aircraft for the full, half and quarter density models.

Finally, it is possible to relate the LAX model to other major hubs in the United States by using Figure C-13. In Figure C-13, estimates of aircraft densities for the top 60 hubs are presented. Note that LAX for 1985 is given as  $0.095 \text{ aircraft/nmi}^2$ . This figure is based on an assumption of uniform density distribution. From Figures C-5 through C-10, however, it is observed that peaking factors of 3 or 4 to 1 occur so that local densities on the order of 0.3 to 0.4 aircraft/nmi<sup>2</sup> exist. This has also been verified by recent flight tests in LAX where peak densities of approximately  $0.1 \text{ aircraft/nm}^2$  were experienced of just transponder-equipped aircraft. The 1975 figure of  $0.048 \text{ aircraft/nmi}^2$  in Figure C-13, reduced by 30%, approximates the number of transponder aircraft ( $.039 \text{ aircraft/nmi}^2$ ), so that a peaking factor of 3 yields  $\approx 0.1 \text{ aircraft/nmi}^2$  which correlates with the test data.



	BASIN	BCAS	ABS. MAX
FULL	743	116	140
HALF	382	66	80
QUARTER	177	29	35

Figure C-12: NUMBER OF AIRCRAFT WITHIN 1- nmi RADIUS OFBCAS



HUB	1975	1980	1985	1990	1995
LAX	0.048	0.068	0.095	0.133	0.128
CHI	0.028	0.040	0.056	0.079	0.110
MIA	0.025	0.038	0.050	0.070	0.098
SFO	0.022	0.031	0.043	0.061	0.085
NYC	0.020	0.029	0.040	0.057	0.079
DFW	0.020	0.028	0.039	0.055	0.078
WAS	0.017	0.023	0.033	0.046	0.064
DET	0.018	0.023	0.032	0.046	0.064
MSP	0.016	0.022	0.031	0.044	0.061
EWR	0.014	0.019	0.027	0.038	0.053
IAH	0.013	0.019	0.026	0.037	0.051
SEA	0.013	0.018	0.025	0.036	0.049
ATL	0.012	0.017	0.024	0.034	0.048
BOS	0.011	0.016	0.022	0.031	0.044
MKC	0.009	0.013	0.018	0.026	0.036
PHL	0.009	0.013	0.018	0.025	0.035
DEN	0.009	0.013	0.018	0.025	0.035
CLE	0.009	0.012	0.017	0.024	0.034
PIT	0.009	0.012	0.017	0.024	0.034
STL	0.007	0.010	0.014	0.020	0.028
MSY	0.006	0.008	0.011	0.016	0.022
LAS	0.004	0.006	0.008	0.011	0.016
BAL	0.003	0.004	0.006	0.009	0.012

#### HIGH DENSITY HUBS (50nm radius)

OKC	0.029	0.041	0.057	0.081	0.113
SAN	0.027	0.039	0.054	0.076	0.107
TUL	0.026	0.036	0.051	0.071	0.100
RIV	0.025	0.036	0.050	0.071	0.099
SJC	0.025	0.035	0.049	0.069	0.096
PDX	0.024	0.034	0.047	0.067	0.093
IND	0.024	0.033	0.046	0.065	0.091
TPA	0.023	0.032	0.045	0.063	0.088
MKE	0.022	0.031	0.043	0.060	0.084
PHX	0.021	0.029	0.041	0.057	0.080
SAC	0.018	0.028	0.036	0.051	0.072
CMH	0.018	0.026	0.036	0.050	0.070
LOU	0.018	0.025	0.035	0.049	0.068
MEM	0.016	0.022	0.031	0.044	0.061
BDL	0.015	0.020	0.029	0.040	0.056
BUF	0.014	0.020	0.028	0.040	0.056
CMA	0.014	0.019	0.027	0.038	0.053
ABQ	0.013	0.018	0.025	0.036	0.050
CIN	0.012	0.017	0.024	0.034	0.047
JAX	0.012	0.017	0.024	0.034	0.047
ORL	0.011	0.015	0.021	0.030	0.042
TUS	0.010	0.014	0.020	0.028	0.040
SAT	0.010	0.014	0.020	0.028	0.039
GSO	0.010	0.014	0.019	0.027	0.038
DAY	0.009	0.013	0.018	0.026	0.036
PBI	0.009	0.013	0.018	0.025	0.036
GEG	0.008	0.012	0.017	0.023	0.033
SLC	0.008	0.011	0.015	0.021	0.030
ORF	0.008	0.011	0.015	0.021	0.030
ROC	0.007	0.009	0.013	0.018	0.026
ELP	0.006	0.008	0.012	0.016	0.023
RIC	0.006	0.008	0.012	0.016	0.023
RNO	0.005	0.008	0.011	0.015	0.021
BNA	0.005	0.007	0.010	0.014	0.020
SYR	0.005	0.007	0.010	0.014	0.020
CLT	0.005	0.007	0.010	0.013	0.019
RDU	0.004	0.006	0.009	0.012	0.017

#### MEDIUM DENSITY HUBS (30nm radius)

Figure C-13: AIRCRAFT DENSITY AT THE 60 TOP HUBS  
(Aircraft per square nautical mile)



### References

- C<sub>1</sub> Cohen, S., Maginnis, F., "Statistical Summary for Los Angeles Basin Standard Traffic Model", MITRE MTR 6387, April 1973.
- C<sub>2</sub> Goldman, D., "Air Traffic Activity Projections for 1995", MITRE MTR 6419 series 3, March 1974.



## APPENDIX D

### RADAR COVERAGE

The passive BCAS derives its proximity information from ground radar interrogations and airborne transponder replies. Therefore passive mode BCAS operation is limited to areas of suitable ground radar coverage and geometry. This may be contrasted with active BCAS operation which derives all of its data from air-to-air interrogation and reply.

### COVERAGE

Low altitude radar coverage is illustrated in Figures D-1 through D-4 for the 88 FAA enroute and 162 FAA terminal radars in CONUS. The airport surveillance radars are plotted for equivalent heights of 1250 and 5000 foot altitudes (50 and 100 nm ranges). The air route surveillance radars shows coverage for 5000 and 20,000 foot altitudes (100 and 200 nm ranges). These figures illustrate the vast areas of CONUS which have no low altitude radar coverage at all, including significant areas in congested regions. Active ranging techniques must be employed in areas with no coverage to provide adequate collision protection.



A radar coverage computer program ("CIRCLE") was developed to plot the local coverage limit envelopes for radars at the top 60 hubs. The program used a file of the locations of 698 CONUS radars active as of 1976. The output is a series of 120 plots centered at the principal airport of each of the 60 major hubs at 4000 ft. and 1000 ft. altitudes and are included as Attachment 1 of this Appendix. This included the 23 high density and 37 medium density hubs classified by revenue passenger enplanements, and the 301 within those 60 hubs [2]. An example is given in Figure D-5 which illustrates the coverage limit at 1000 ft. altitude of the four radars in the vicinity of the New Orleans' Moisant airport. As in all the other plots, the output assumes a smooth spherical Earth line-of-sight limitation on radar reception. Terrain and buildings will seriously reduce the envelopes but were too complex an issue to be dealt with properly within the constraints of this analysis. Multipath problems would also limit the usefulness of the signals at certain azimuths and elevations. These effects were also considered too complex to be treated here, although excellent treatments of both ground-to-air and air-to-air multipath are available in recent reports (15, 16).

In Figure D-5 the numbers on the plot are locations of the radars, and 45 nm radius circles are drawn about each indicating the reception limit at 1000 ft. altitude. There



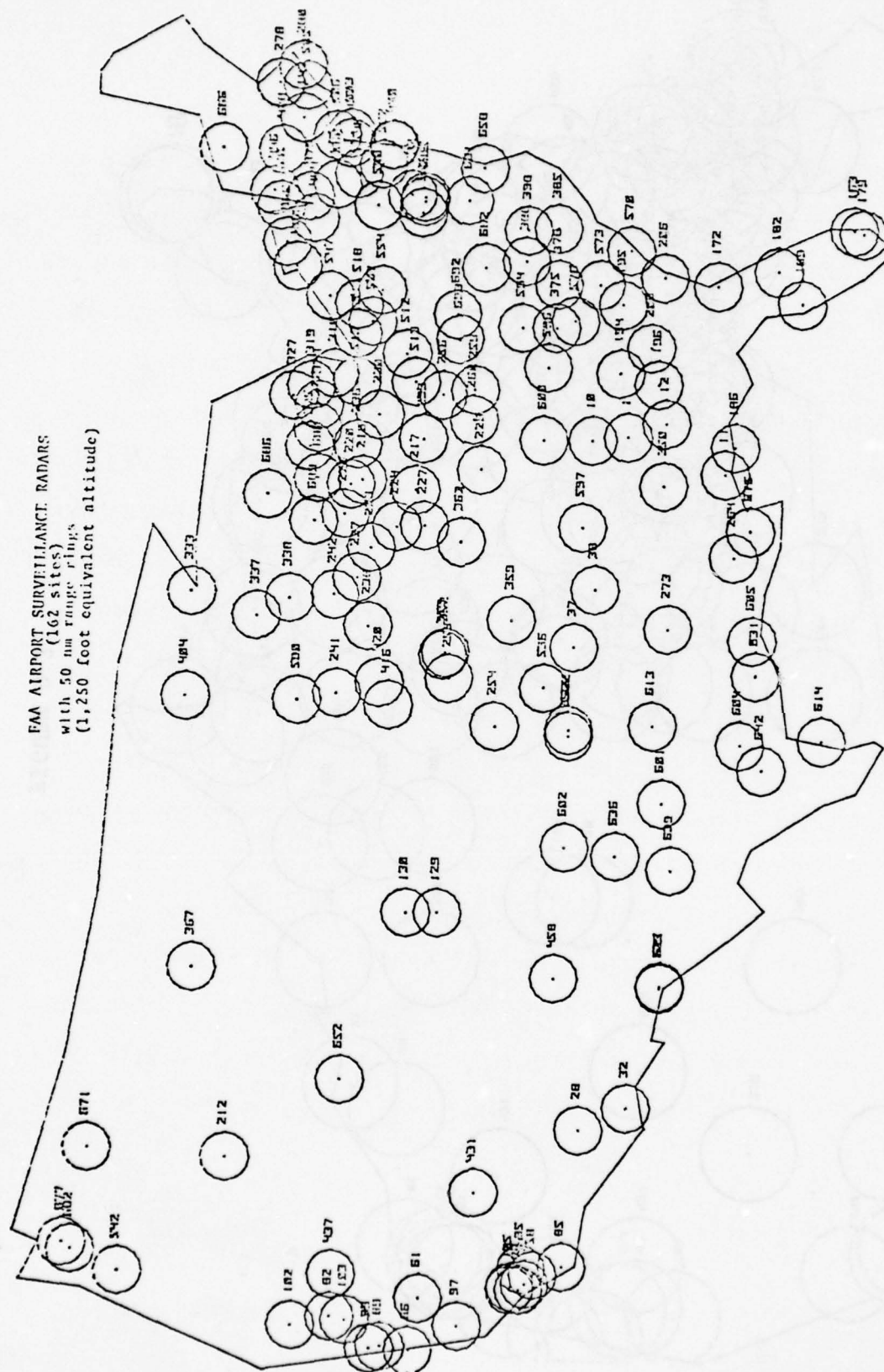


FIGURE D-1



FAA AIRPORT SURVEILLANCE RADARS  
(162 sites)  
with 100 nm range rings  
(5,000 foot equivalent altitude)

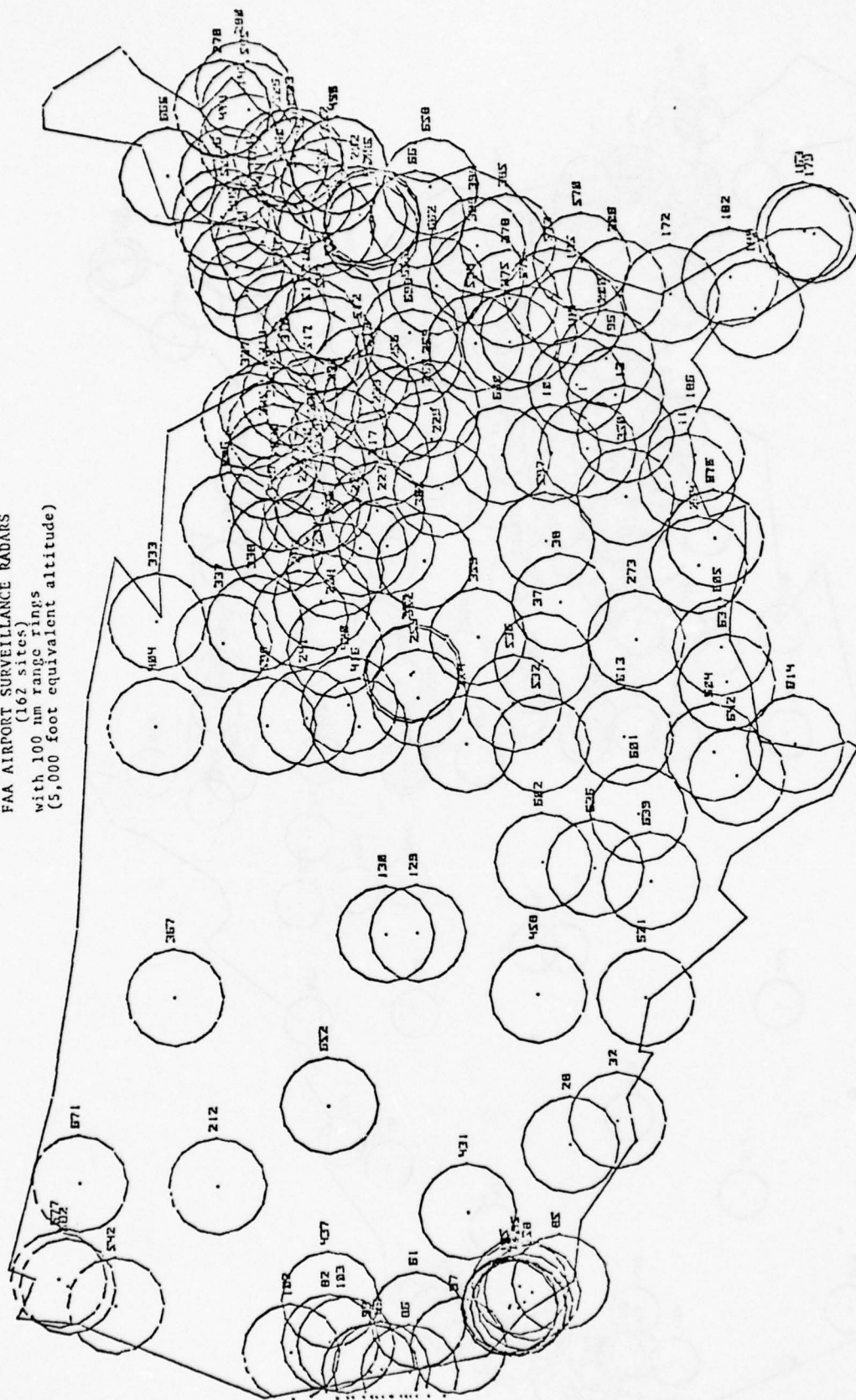


FIGURE D-2







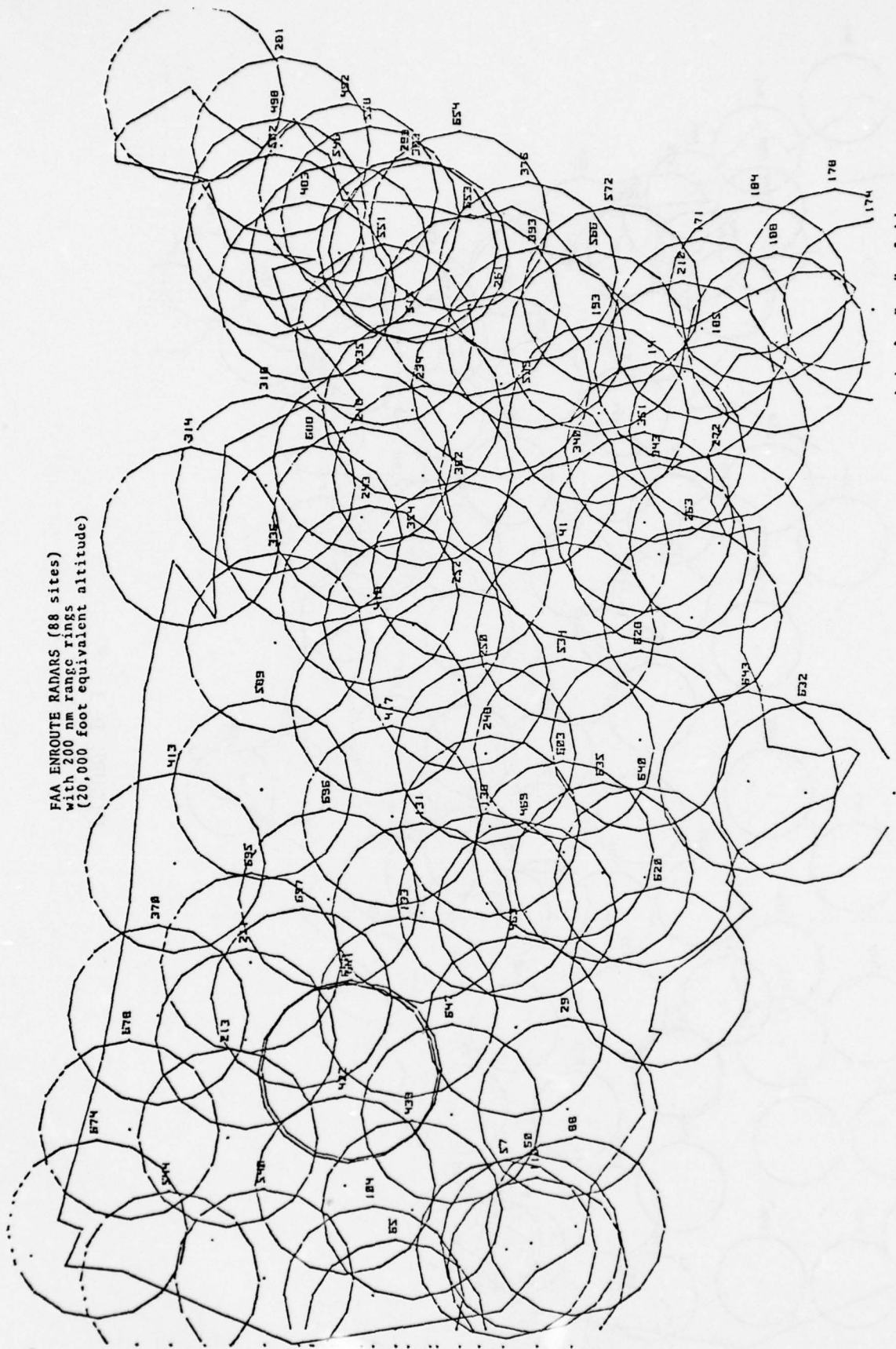


FIGURE D-4



M S Y

NEW ORLEANS (MOISANT)

WEIGHT 1000 GIVES RADIUS 44.72135  
SIZE OF AREA <RADIUS (NM)> 60  
FILE # 271 USED AS NOMINAL SITE  
RADAR # 270 WITHIN 17.84088285  
RADAR # 271 WITHIN 0 NM  
RADAR # 272 WITHIN 37.3495143  
RADAR # 616 WITHIN 0 NM  
\*\*\*\* \*\*\*\*\* \*\*\*\*\*

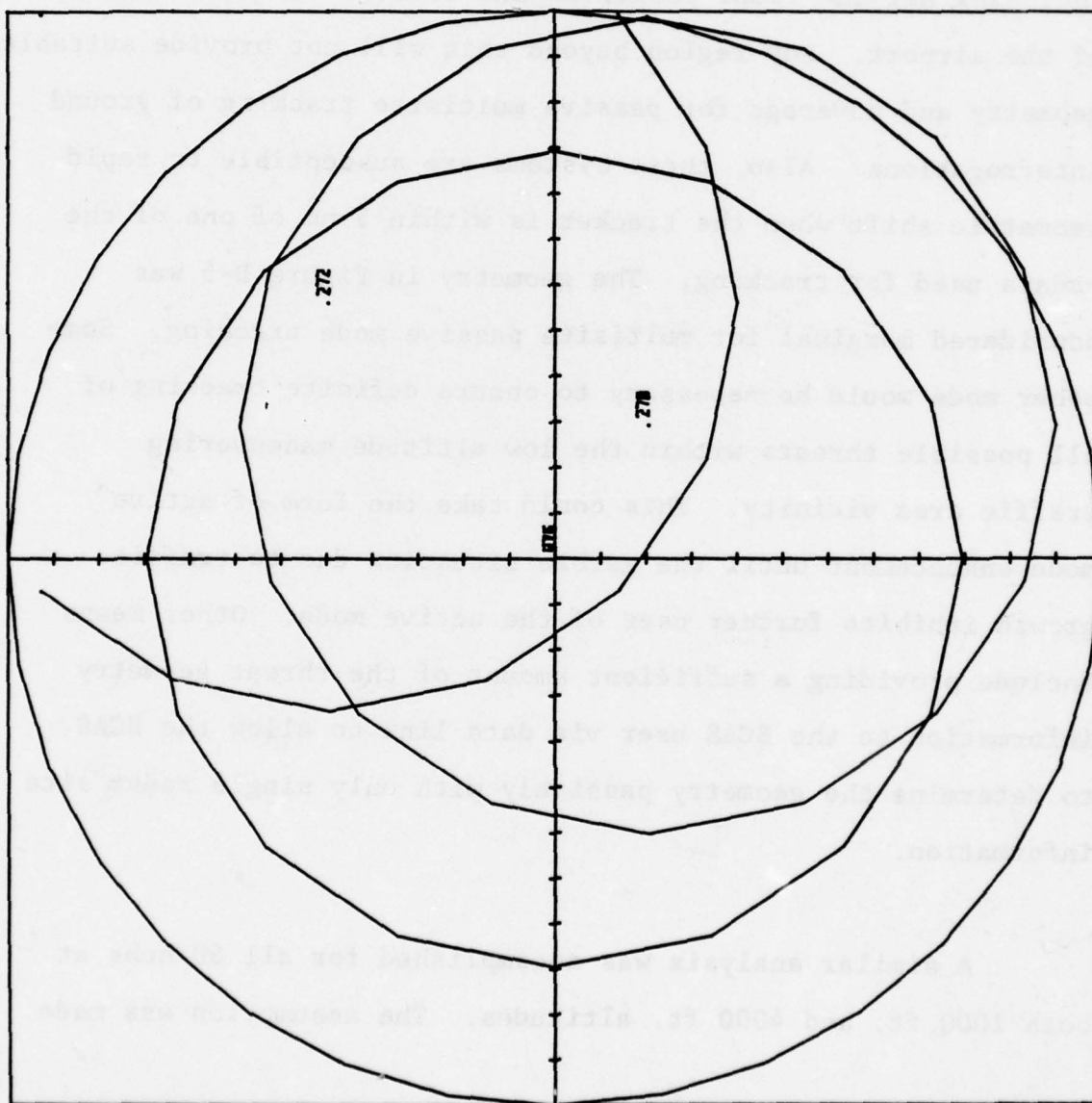


FIGURE D-5 RADAR COVERAGE  
PLOT INDICATING THE RECEP-  
TION LIMITS AT 1000'



is also a 60 nm radius range ring drawn about Moisant for reference. It can be seen that approaching from the Southwest, coverage from radar #272 is not obtained until within 7 nm of the airport which allows about two minutes of tracking time. It can be seen that the region in Figure D-5 suitable for multisite passive BCAS is limited to a roughly 40 by 30 nm region including all the radar positions and located to the Northeast of the airport. Any region beyond this will not provide suitable geometry and coverage for passive multisite tracking of ground interrogations. Also, these systems are susceptible to rapid geometric shift when the tracker is within 5 nm of one of the radars used for tracking. The geometry in Figure D-5 was considered marginal for multisite passive mode tracking. Some other mode would be necessary to ensure definite tracking of all possible threats within the low altitude maneuvering traffic area vicinity. This could take the form of active mode enhancement until the garble situation due to traffic growth inhibits further user of the active mode. Other means include providing a sufficient amount of the threat geometry information to the BCAS user via data link to allow the BCAS to determine the geometry passively with only single radar site information.

A similar analysis was accomplished for all 60 hubs at both 1000 ft. and 4000 ft. altitudes. The assumption was made



	@ 4000 FT ALTITUDE	@ 1000 FT ALTITUDE
HUBS	12	40
AIRPORTS	54	191
AC	17	57
GA	37	134

**FIGURE D-6** HUBS AND AIRPORT WHERE RADAR COVERAGE  
LIMITS BCAS USE



that the radar deployment would remain constant (i.e., only replacing existing sites with newer equipment, no decommissioning of old sites or commissioning of new ones). Figure D-6 summarizes these results by the total hubs lost at each altitude, and the total airports and types of airports within these hubs.



APPENDIX D

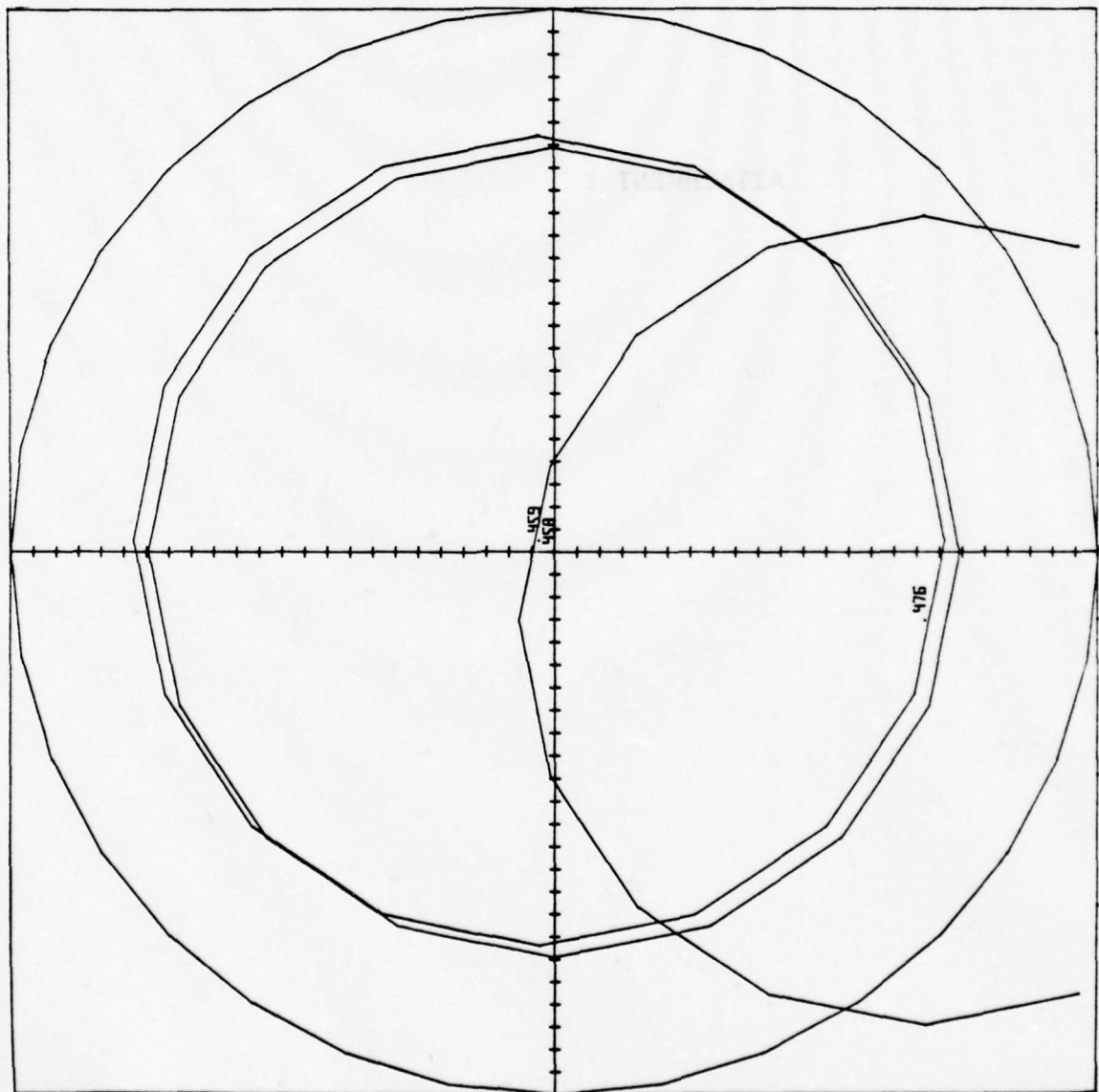
ATTACHMENT 1



ABQ

ALBUQUERQUE, N. M.

1000 4000 5000 6000 7000 8000 9000 10000  
 111 112 113 114 115 116 117 118 119 120  
 121 122 123 124 125 126 127 128 129 130  
 131 132 133 134 135 136 137 138 139 140  
 141 142 143 144 145 146 147 148 149 150  
 151 152 153 154 155 156 157 158 159 160  
 161 162 163 164 165 166 167 168 169 170  
 171 172 173 174 175 176 177 178 179 180  
 181 182 183 184 185 186 187 188 189 190  
 191 192 193 194 195 196 197 198 199 200





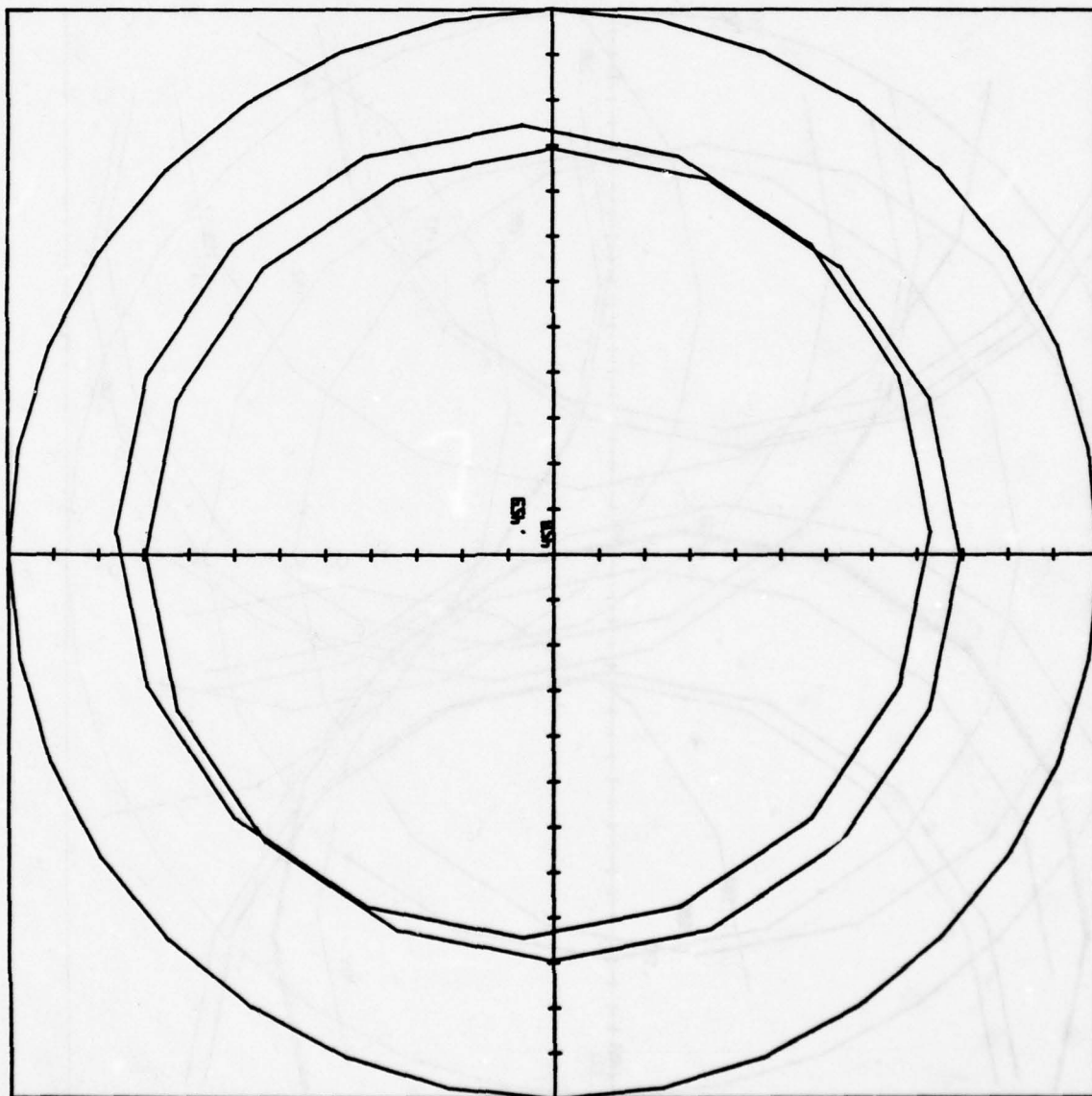
ABQ

ALBUQUERQUE, N. M.

WEIGHT 1000 CIVES RADIUS 44.72124955  
SIZE OF AREA (RADIUS 44.72124955)

FILE # 458 USED AS NOMINAL SITE 1

RADAR # 458 WITHIN 0 NM  
RADAR # 459 WITHIN 4.122479257 NM  
\*\*\*\*\* \*\*\*\*\*





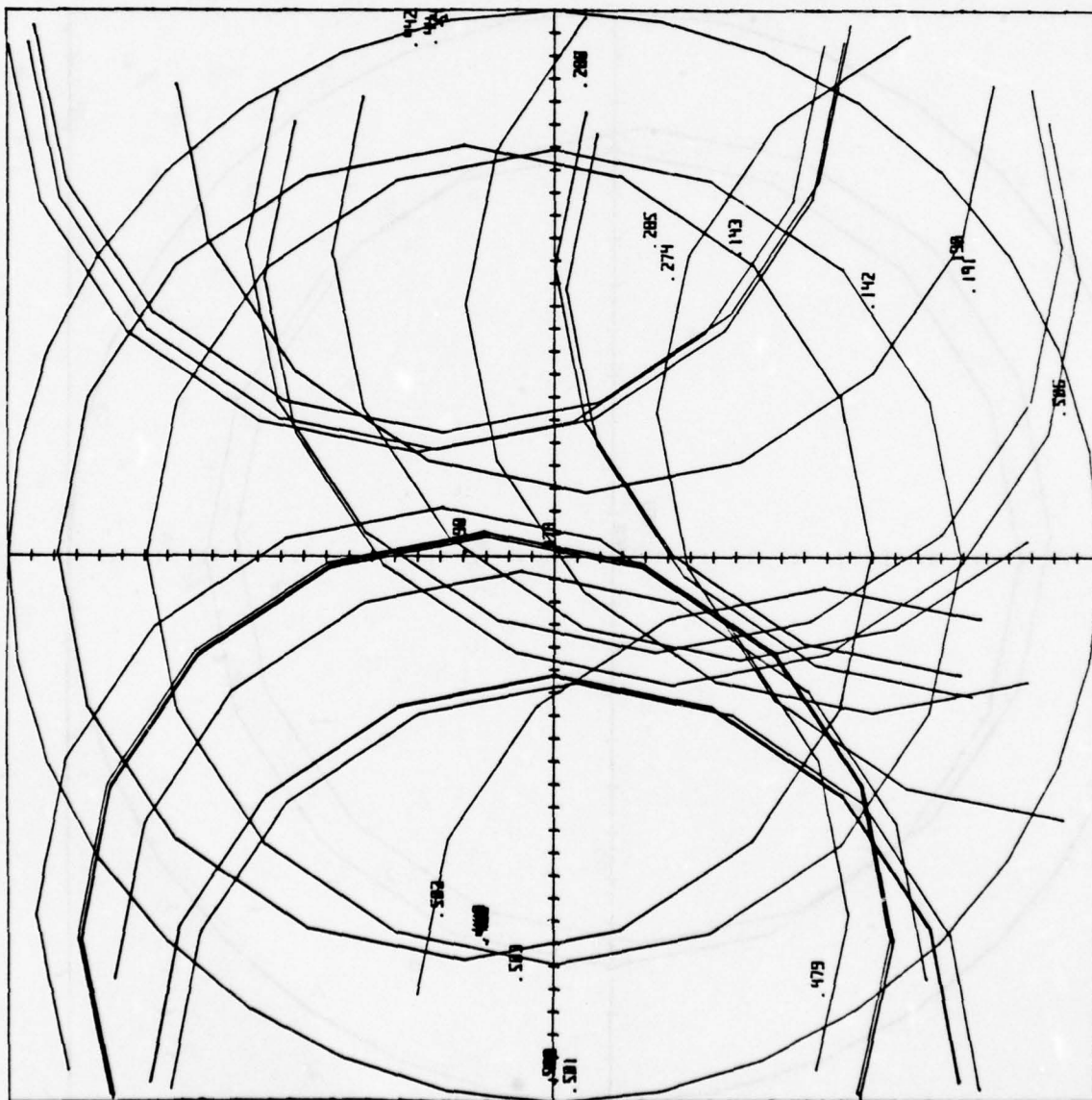
ALB

ALBANY, N. Y.

HEIGHT 4000 CIVILS PHOTUS 89.44271910  
 SIZE OF AREA PHOTOGRAPH 120

FILE # 478 USED AS NOMINAL SITE

GROUP # 139	WITHIN 109.7493567	MM
GROUP # 140	WITHIN 109.7493567	MM
GROUP # 141	WITHIN 109.7493567	MM
GROUP # 142	WITHIN 109.7493567	MM
GROUP # 143	WITHIN 109.7493567	MM
GROUP # 144	WITHIN 109.7493567	MM
GROUP # 145	WITHIN 109.7493567	MM
GROUP # 146	WITHIN 109.7493567	MM
GROUP # 147	WITHIN 109.7493567	MM
GROUP # 148	WITHIN 109.7493567	MM
GROUP # 149	WITHIN 109.7493567	MM
GROUP # 150	WITHIN 109.7493567	MM
GROUP # 151	WITHIN 109.7493567	MM
GROUP # 152	WITHIN 109.7493567	MM
GROUP # 153	WITHIN 109.7493567	MM
GROUP # 154	WITHIN 109.7493567	MM
GROUP # 155	WITHIN 109.7493567	MM
GROUP # 156	WITHIN 109.7493567	MM
GROUP # 157	WITHIN 109.7493567	MM
GROUP # 158	WITHIN 109.7493567	MM
GROUP # 159	WITHIN 109.7493567	MM
GROUP # 160	WITHIN 109.7493567	MM
GROUP # 161	WITHIN 109.7493567	MM
GROUP # 162	WITHIN 109.7493567	MM
GROUP # 163	WITHIN 109.7493567	MM
GROUP # 164	WITHIN 109.7493567	MM
GROUP # 165	WITHIN 109.7493567	MM
GROUP # 166	WITHIN 109.7493567	MM
GROUP # 167	WITHIN 109.7493567	MM
GROUP # 168	WITHIN 109.7493567	MM
GROUP # 169	WITHIN 109.7493567	MM
GROUP # 170	WITHIN 109.7493567	MM
GROUP # 171	WITHIN 109.7493567	MM
GROUP # 172	WITHIN 109.7493567	MM
GROUP # 173	WITHIN 109.7493567	MM
GROUP # 174	WITHIN 109.7493567	MM
GROUP # 175	WITHIN 109.7493567	MM
GROUP # 176	WITHIN 109.7493567	MM
GROUP # 177	WITHIN 109.7493567	MM
GROUP # 178	WITHIN 109.7493567	MM
GROUP # 179	WITHIN 109.7493567	MM
GROUP # 180	WITHIN 109.7493567	MM
GROUP # 181	WITHIN 109.7493567	MM
GROUP # 182	WITHIN 109.7493567	MM
GROUP # 183	WITHIN 109.7493567	MM
GROUP # 184	WITHIN 109.7493567	MM
GROUP # 185	WITHIN 109.7493567	MM
GROUP # 186	WITHIN 109.7493567	MM
GROUP # 187	WITHIN 109.7493567	MM
GROUP # 188	WITHIN 109.7493567	MM
GROUP # 189	WITHIN 109.7493567	MM
GROUP # 190	WITHIN 109.7493567	MM
GROUP # 191	WITHIN 109.7493567	MM
GROUP # 192	WITHIN 109.7493567	MM
GROUP # 193	WITHIN 109.7493567	MM
GROUP # 194	WITHIN 109.7493567	MM
GROUP # 195	WITHIN 109.7493567	MM
GROUP # 196	WITHIN 109.7493567	MM
GROUP # 197	WITHIN 109.7493567	MM
GROUP # 198	WITHIN 109.7493567	MM
GROUP # 199	WITHIN 109.7493567	MM
GROUP # 200	WITHIN 109.7493567	MM

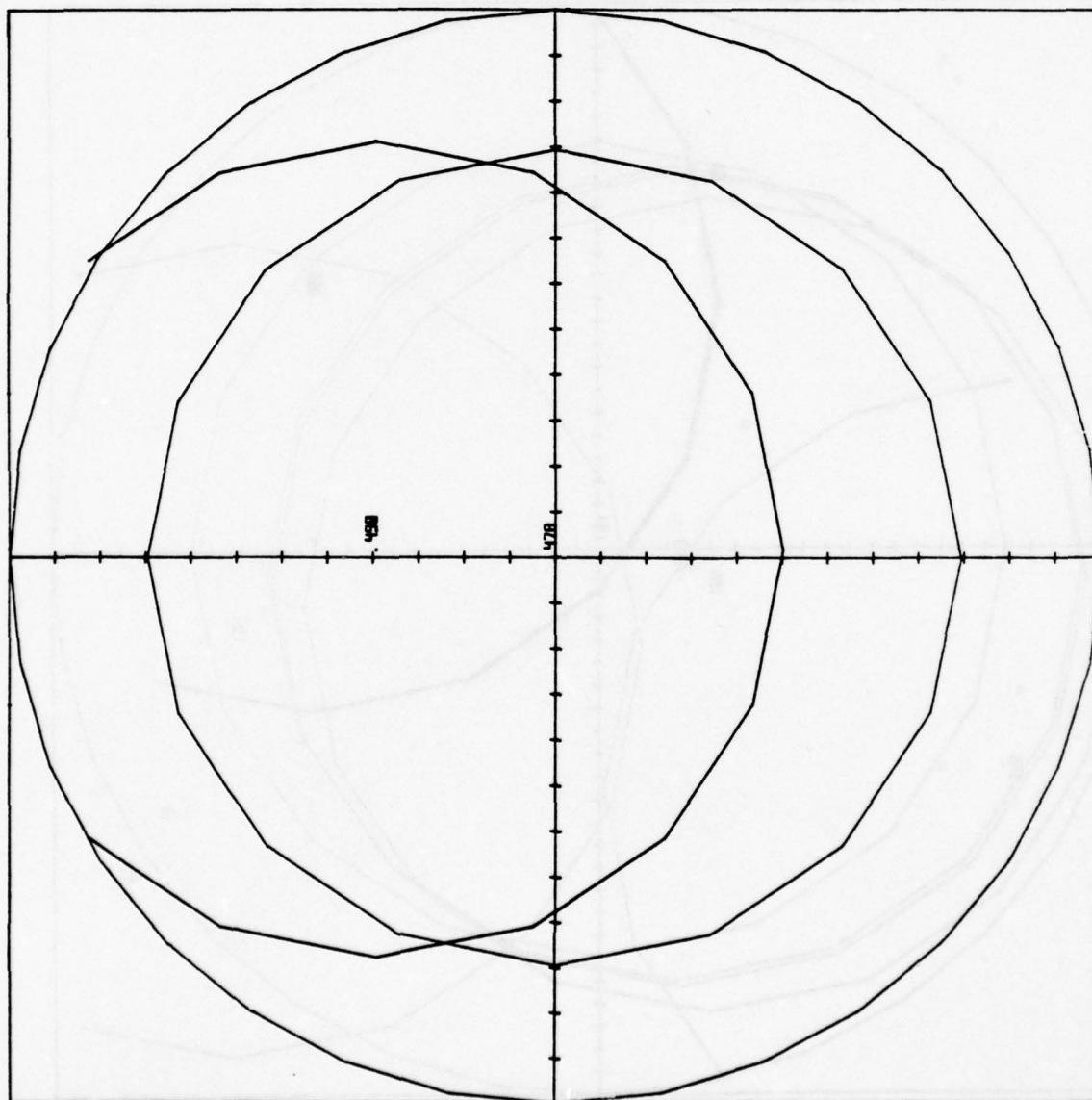




ALB

ALBANY, N. Y.

HEIGHT 1.00  
SIZE OF AREA 19.60344353  
FILE # 478 USED AS HORIZONTAL SITE  
PHOTO # 478 WITHIN 0 NH  
PHOTO # 497 WITHIN 19.60344353 NH  
PHOTO # 498 WITHIN 19.60344353 NH  
\*\*\*\*\*

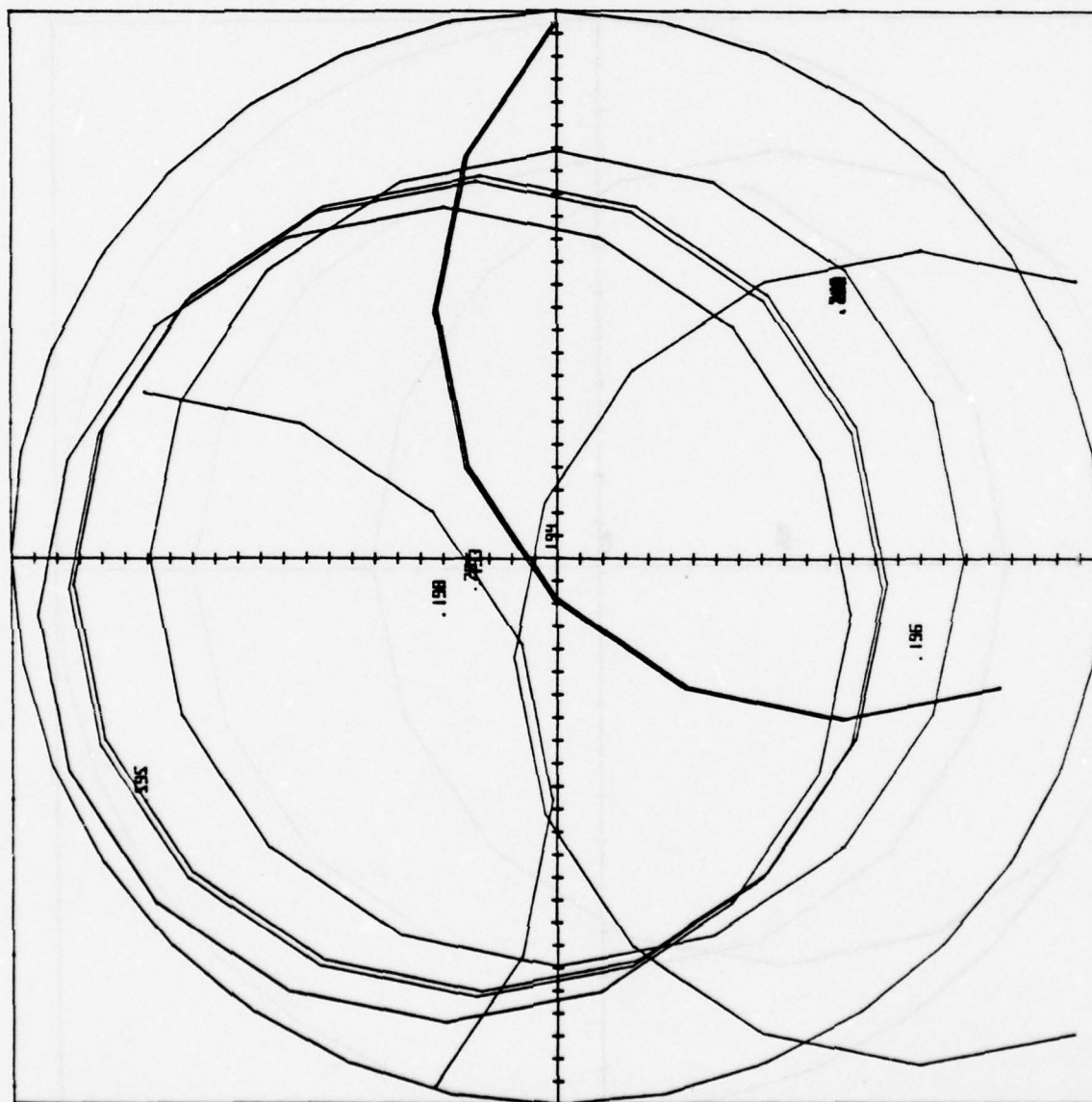




**ATLANTA, GA.**

LIGHT 4000 GIVES RADIUS 89.44271  
 SIZE OF AREA / RADIUS = 129

3113 TANTON ST DESO 461 # 37

[illegible]



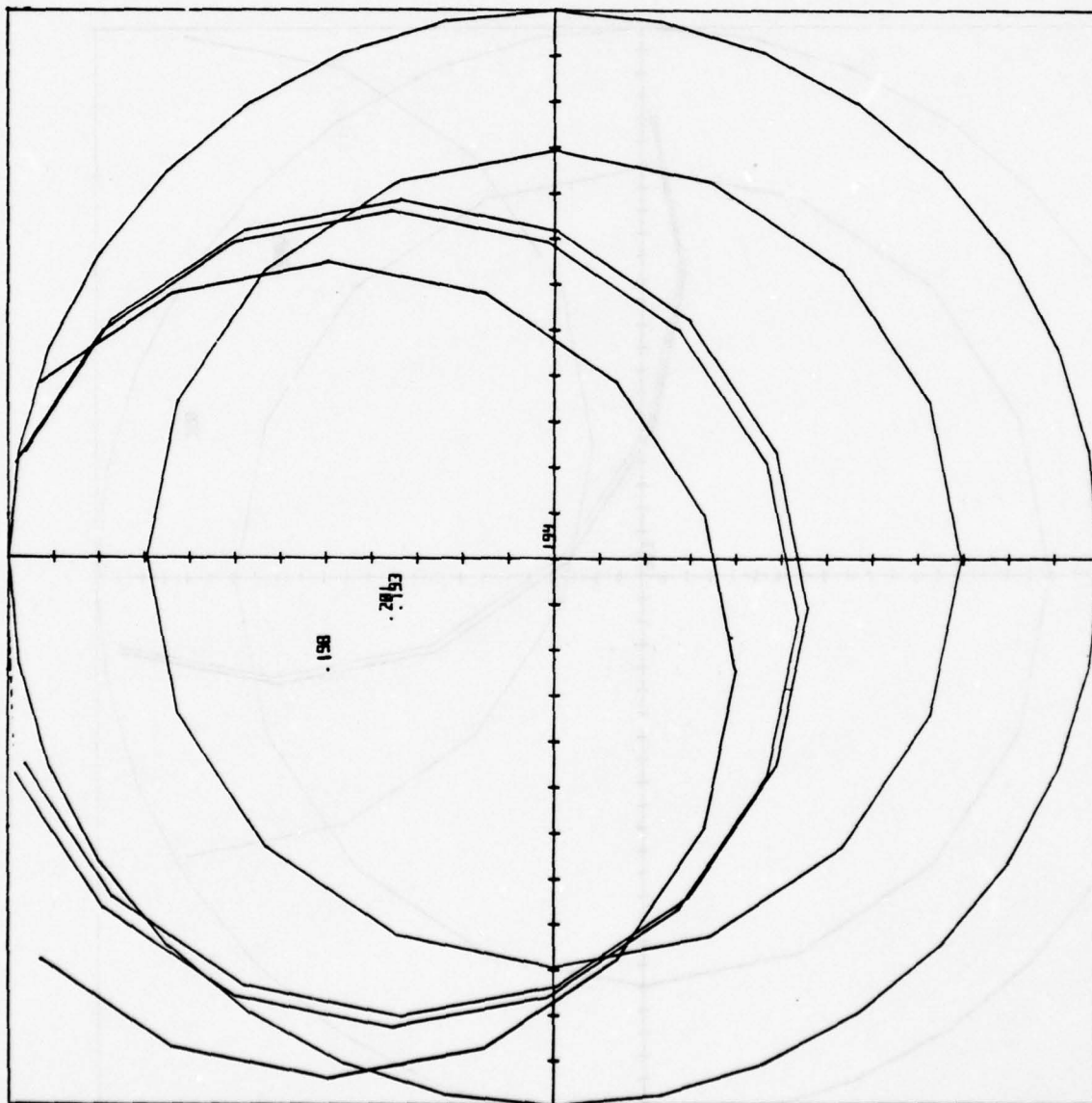
ATL

ATLANTA, GA.

UNIT  
SITE OF NPLM RADIUS (NM) 60

FILE # 194 USED AS NORTHERL SITE

PHASE # 193 WITHIN 17.7052090 NM  
PHASE # 194 WITHIN 0 NM  
PHASE # 195 WITHIN 27.6513172 NM  
PHASE # 196 WITHIN 27.6513172 NM  
PHASE # 201 WITHIN 19.0830648 NM



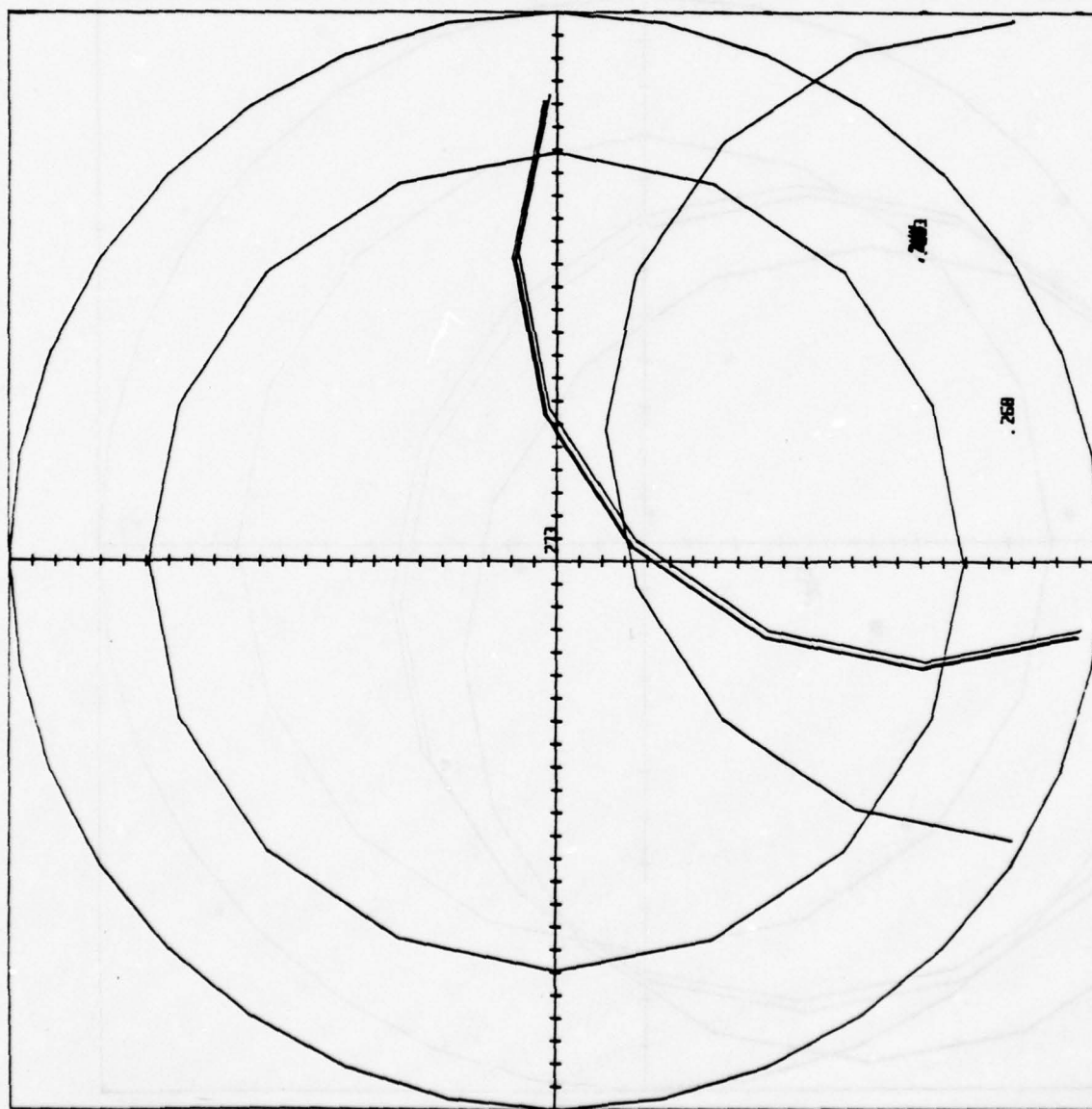


SHREVEPORT, LA.  
BARKSDALE AFB

```

      LIGHT 40000      CTYPE = FAD1005 896.44271
      CE OF MEAN <FAD1005> (HH) = 120
      LE # 273 USED FOR ROUTING STATE

```

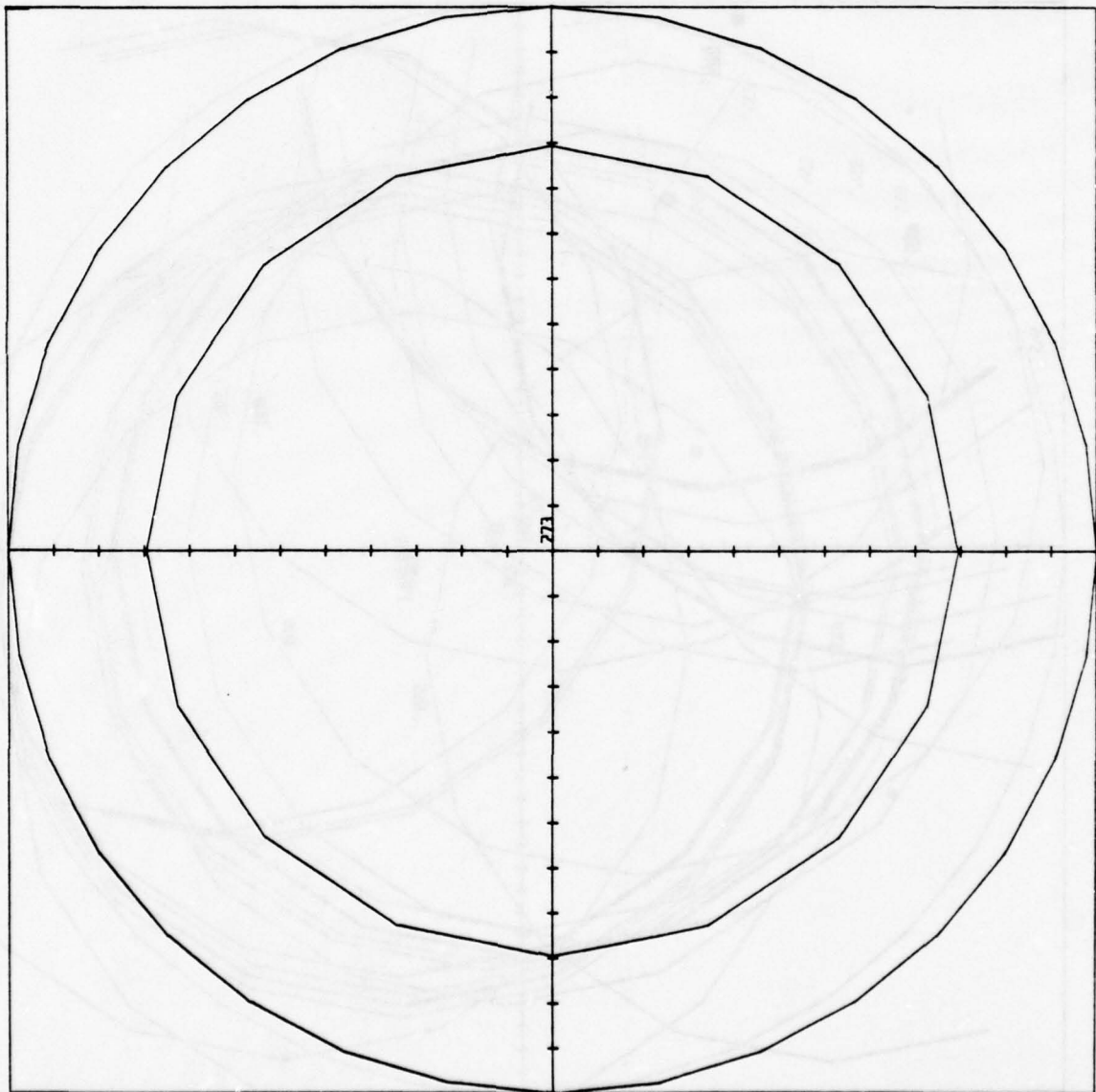




BAD

SHEVEPORT, LA.  
BARKDALE AFB

4000 1000 61200 60000 44.721 5  
LE OF NEEN 60000 4000 60  
LE # 213 USED AS NOMINAL SITE  
FIGURE # 213 WITHIN 0 00  
... \*\*\*\*\*



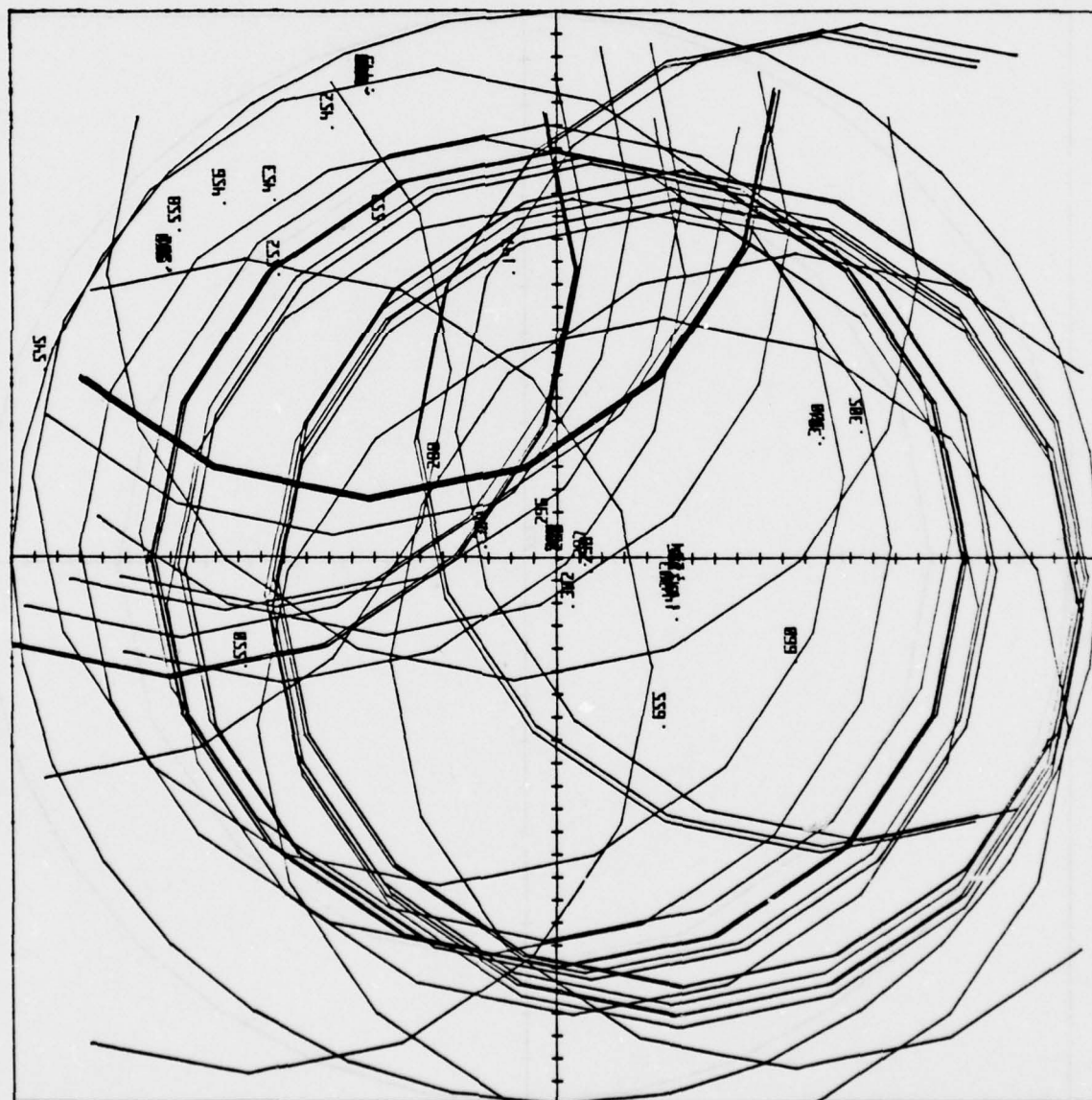


**BALTIMORE, MD.**

THE LIGHT 40000 GELS POLYUS 89.44.1979  
SIZE OF OPEN CHANNELS (nm) 120

E # 292 USED AS NORMAL SITE

144	111111	11.95551345	N
145	111111	18.5712293	N
146	111111	27.6052587	N
147	111111	61.4442049	N
148	111111	31.4182162	N
149	111111	9.4260219	N
150	111111	1.8213157	100
151	111111	0.4260219	N
152	111111	0	100
153	111111	0.4260219	N
154	111111	28.74440676	N
155	111111	61.4442049	N
156	111111	6.18645224	N
157	111111	0.58623444	N
158	111111	6.18645224	N
159	111111	0.186876157	N
160	111111	0.186876157	N
161	111111	64.43307328	N
162	111111	33.31685609	N
163	111111	11.24957847	N
164	111111	26.57541653	N
165	111111	15.76525466	N
166	111111	12.67603744	N
167	111111	111.0652201	100
168	111111	103.976094	100
169	111111	110.6873773	N
170	111111	110.1108459	N
171	111111	111.0652201	N
172	111111	106.5893377	N
173	111111	9.52510142	N
174	111111	106.7405485	N
175	111111	11.4544638	N
176	111111	21.5117277	N
177	111111	87.06814362	N
178	111111	81.70634479	N
179	111111	103.9760943	N
180	111111	106.1134417	N
181	111111	105.8133174	N
182	111111	106.7405485	N
183	111111	43.8801154	N
184	111111	57.42381176	N





ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

FILE # 292 USED W/ NORMAL SITE

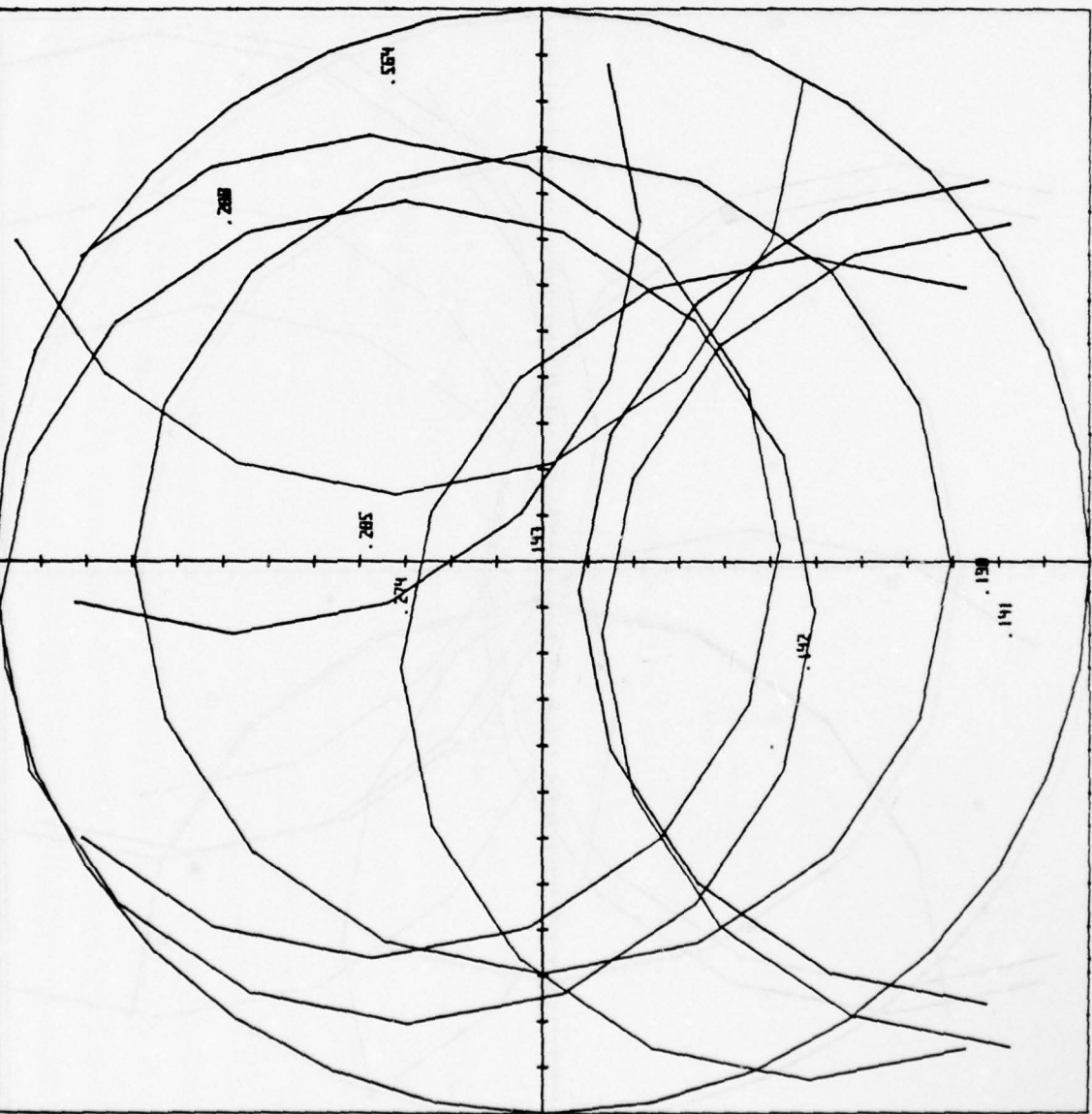
Ende	144	0.0000	27.95551345	00
Ende	145	0.0000	28.51872494	00
Ende	146	0.0000	29.08293643	00
Ende	147	0.0000	29.64714792	00
Ende	148	0.0000	31.48261167	00
Ende	149	0.0000	0.42902419	00
Ende	150	0.0000	1.09131557	00
Ende	151	0.0000	0.42903919	00
Ende	152	0.0000	0	00
Ende	153	0.0000	0.42904047	00
Ende	154	0.0000	0.84404047	00
Ende	155	0.0000	0.42904047	00
Ende	156	0.0000	0.42904047	00
Ende	157	0.0000	0.84404047	00
Ende	158	0.0000	0.42904047	00
Ende	159	0.0000	0.84404047	00
Ende	160	0.0000	0.42904047	00
Ende	161	0.0000	0.84404047	00
Ende	162	0.0000	0.42904047	00
Ende	163	0.0000	0.84404047	00
Ende	164	0.0000	0.42904047	00
Ende	165	0.0000	0.84404047	00
Ende	166	0.0000	0.42904047	00
Ende	167	0.0000	0.84404047	00
Ende	168	0.0000	0.42904047	00
Ende	169	0.0000	0.84404047	00
Ende	170	0.0000	0.42904047	00
Ende	171	0.0000	0.84404047	00
Ende	172	0.0000	0.42904047	00
Ende	173	0.0000	0.84404047	00
Ende	174	0.0000	0.42904047	00
Ende	175	0.0000	0.84404047	00
Ende	176	0.0000	0.42904047	00
Ende	177	0.0000	0.84404047	00
Ende	178	0.0000	0.42904047	00
Ende	179	0.0000	0.84404047	00
Ende	180	0.0000	0.42904047	00
Ende	181	0.0000	0.84404047	00
Ende	182	0.0000	0.42904047	00
Ende	183	0.0000	0.84404047	00
Ende	184	0.0000	0.42904047	00
Ende	185	0.0000	0.84404047	00
Ende	186	0.0000	0.42904047	00
Ende	187	0.0000	0.84404047	00
Ende	188	0.0000	0.42904047	00
Ende	189	0.0000	0.84404047	00
Ende	190	0.0000	0.42904047	00
Ende	191	0.0000	0.84404047	00
Ende	192	0.0000	0.42904047	00
Ende	193	0.0000	0.84404047	00
Ende	194	0.0000	0.42904047	00
Ende	195	0.0000	0.84404047	00
Ende	196	0.0000	0.42904047	00
Ende	197	0.0000	0.84404047	00
Ende	198	0.0000	0.42904047	00
Ende	199	0.0000	0.84404047	00



FILE # 143 USED FOR IDENTIFICATION SITE

Frufk # 139	W1000	43.86	35.61	N
Frufk # 140	W1000	43.86	35.61	N
Frufk # 141	W1000	51.865	1.278	N
Frufk # 142	W1000	31.468	9.664	N
Frufk # 143	W1000	0	0	N
Frufk # 174	W1000	15.361	18.485	N
Frufk # 275	W1000	79.467	2.613	N
Frufk # 276	W1000	79.467	2.613	N
Frufk # 277	W1000	80.837	57.833	N
Frufk # 278	W1000	80.837	57.833	N
Frufk # 279	W1000	36.75	26.753	N
Frufk # 280	W1000	109.33	40.465	N
Frufk # 281	W1000	89.333	7.03	N
Frufk # 282	W1000	77.9606	7.45	N
Frufk # 283	W1000	86.9470	4.374	N
Frufk # 285	W1000	18.7436	3.847	N
Frufk # 286	W1000	50.126	8.415	N
Frufk # 287	W1000	50.126	8.415	N
Frufk # 442	W1000	84.354	1.461	N
Frufk # 443	W1000	84.354	1.461	N
Frufk # 445	W1000	81.0831	0.093	N
Frufk # 457	W1000	113.51	0.746	N
Frufk # 478	W1000	138.26	0.4942	N
Frufk # 481	W1000	76.573	3.065	N
Frufk # 482	W1000	76.573	3.065	N
Frufk # 483	W1000	81.000	36.22	N
Frufk # 491	W1000	77.462	1.164	N
Frufk # 492	W1000	77.462	1.164	N
Frufk # 493	W1000	109.51	1.8016	N
Frufk # 494	W1000	83.3824	1.29	N
Frufk # 495	W1000	83.3824	1.29	N
Frufk # 496	W1000	79.3806	1.13	N
Frufk # 564	W1000	54.4	3.959	N
Frufk # 565	W1000	54.4	3.959	N





BDL  
HARTFORD, CONN.  
(WINDSOR LOCKS)

100T 1000 GIVES RADIOS 44.721350  
2E OF AREA (RADIOS (HR)) 60

LE # 143 USED AS NORMAL SITE

RADIO # 139	WITHIN 48.06355161
RADIO # 140	WITHIN 48.06355161
RADIO # 141	WITHIN 51.86571278
RADIO # 142	WITHIN 51.46879664
RADIO # 143	WITHIN 0
RADIO # 274	WITHIN 15.86188485
RADIO # 285	WITHIN 18.74383147
RADIO # 286	WITHIN 50.13678915
RADIO # 287	WITHIN 50.13678915
RADIO # 564	WITHIN 54.47553741



BHM

BIRMINGHAM, ALA.

HEIGHT 4000 CIVES PHOTOS 89-442719  
 SITE OF AREA PHOTOS 100-120

FILE # 1 USED AS NORMAL SITE

PHOTO #	FILE #	FILE #	FILE #
1	00000	0	000
2	00000	05	0004018
3	00000	06	0006043
4	00000	07	0008068
5	00000	08	0010093
6	00000	09	0012118
7	00000	10	0014143
8	00000	11	0016168
9	00000	12	0018193
10	00000	13	0020218
11	00000	14	0022243
12	00000	15	0024268
13	00000	16	0026293
14	00000	17	0028318
15	00000	18	0030343
16	00000	19	0032368
17	00000	20	0034393
18	00000	21	0036418
19	00000	22	0038443
20	00000	23	0040468
21	00000	24	0042493
22	00000	25	0044518
23	00000	26	0046543
24	00000	27	0048568
25	00000	28	0050593
26	00000	29	0052618
27	00000	30	0054643
28	00000	31	0056668
29	00000	32	0058693
30	00000	33	0060718
31	00000	34	0062743
32	00000	35	0064768
33	00000	36	0066793
34	00000	37	0068818
35	00000	38	0070843
36	00000	39	0072868
37	00000	40	0074893
38	00000	41	0076918
39	00000	42	0078943
40	00000	43	0080968
41	00000	44	0082993
42	00000	45	0085018
43	00000	46	0087043
44	00000	47	0089068
45	00000	48	0091093
46	00000	49	0093118
47	00000	50	0095143
48	00000	51	0097168
49	00000	52	0099193
50	00000	53	0101218
51	00000	54	0103243
52	00000	55	0105268
53	00000	56	0107293
54	00000	57	0109318
55	00000	58	0111343
56	00000	59	0113368
57	00000	60	0115393
58	00000	61	0117418
59	00000	62	0119443
60	00000	63	0121468
61	00000	64	0123493
62	00000	65	0125518
63	00000	66	0127543
64	00000	67	0129568
65	00000	68	0131593
66	00000	69	0133618
67	00000	70	0135643
68	00000	71	0137668
69	00000	72	0139693
70	00000	73	0141718
71	00000	74	0143743
72	00000	75	0145768
73	00000	76	0147793
74	00000	77	0149818
75	00000	78	0151843
76	00000	79	0153868
77	00000	80	0155893
78	00000	81	0157918
79	00000	82	0159943
80	00000	83	0161968
81	00000	84	0163993
82	00000	85	0166018
83	00000	86	0168043
84	00000	87	0170068
85	00000	88	0172093
86	00000	89	0174118
87	00000	90	0176143
88	00000	91	0178168
89	00000	92	0180193
90	00000	93	0182218
91	00000	94	0184243
92	00000	95	0186268
93	00000	96	0188293
94	00000	97	0190318
95	00000	98	0192343
96	00000	99	0194368
97	00000	100	0196393
98	00000	101	0198418
99	00000	102	0200443
100	00000	103	0202468
101	00000	104	0204493
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105	00000	108	0212593
106	00000	109	0214618
107	00000	110	0216643
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109	00000	112	0220693
110	00000	113	0222718
111	00000	114	0224743
112	00000	115	0226768
113	00000	116	0228793
114	00000	117	0230818
115	00000	118	0232843
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119	00000	122	0240943
120	00000	123	0242968
121	00000	124	0244993
122	00000	125	0247018
123	00000	126	0249043
124	00000	127	0251068
125	00000	128	0253093
126	00000	129	0255118
127	00000	130	0257143
128	00000	131	0259168
129	00000	132	0261193
130	00000	133	0263218
131	00000	134	0265243
132	00000	135	0267268
133	00000	136	0269293
134	00000	137	0271318
135	00000	138	0273343
136	00000	139	0275368
137	00000	140	0277393
138	00000	141	0279418
139	00000	142	0281443
140	00000	143	0283468
141	00000	144	0285493
142	00000	145	0287518
143	00000	146	0289543
144	00000	147	0291568
145	00000	148	0293593
146	00000	149	0295618
147	00000	150	0297643
148	00000	151	0299668
149	00000	152	0301693
150	00000	153	0303718
151	00000	154	0305743
152	00000	155	0307768
153	00000	156	0309793
154	00000	157	0311818
155	00000	158	0313843
156	00000	159	0315868
157	00000	160	0317893
158	00000	161	0319918
159	00000	162	0321943
160	00000	163	0323968
161	00000	164	0325993
162	00000	165	0328018
163	00000	166	0330043
164	00000	167	0332068
165	00000	168	0334093
166	00000	169	0336118
167	00000	170	0338143
168	00000	171	0340168
169	00000	172	0342193
170	00000	173	0344218
171	00000	174	0346243
172	00000	175	0348268
173	00000	176	0350293
174	00000	177	0352318
175	00000	178	0354343
176	00000	179	0356368
177	00000	180	0358393
178	00000	181	0360418
179	00000	182	0362443
180	00000	183	0364468
181	00000	184	0366493
182	00000	185	0368518
183	00000	186	0370543
184	00000	187	0372568
185	00000	188	0374593
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187	00000	190	0378643
188	00000	191	0380668
189	00000	192	0382693
190	00000	193	0384718
191	00000	194	0386743
192	00000	195	0388768
193	00000	196	0390793
194	00000	197	0392818
195	00000	198	0394843
196	00000	199	0396868
197	00000	200	0398893
198	00000	201	0400918
199	00000	202	0402943
200	00000	203	0404968
201	00000	204	0406993
202	00000	205	0409018
203	00000	206	0411043
204	00000	207	0413068
205	00000	208	0415093
206	00000	209	0417118
207	00000	210	0419143
208	00000	211	0421168
209	00000	212	0423193
210	00000	213	0425218
211	00000	214	0427243
212	00000	215	0429268
213	00000	216	0431293
214	00000	217	0433318
215	00000	218	0435343
216	00000	219	0437368
217	00000	220	0439393
218	00000	221	0441418
219	00000	222	0443443
220	00000	223	0445468
221	00000	224	0447493
222	00000	225	0449518
223	00000	226	0451543
224	00000	227	0453568
225	00000	228	0455593
226	00000	229	0457618
227	00000	230	0459643
228	00000	231	0461668
229	00000	232	0463693
230	00000	233	0465718
231	00000	234	0467743
232	00000	235	0469768
233	00000	236	0471793
234	00000	237	0473818
235	00000	238	0475843
236	00000	239	0477868
237	00000	240	0479893
238	00000	241	0481918
239	00000	242	0483943
240	00000	243	0485968
241	00000	244	0487993
242	00000	245	0489018
243	00000	246	0491043
244	00000	247	0493068
245	00000	248	0495093
246	00000	249	0497118
247	00000	250	0499143
248	00000	251	0501168
249	00000	252	0503193
250	00000	253	0505218
251	00000	254	0507243
252			



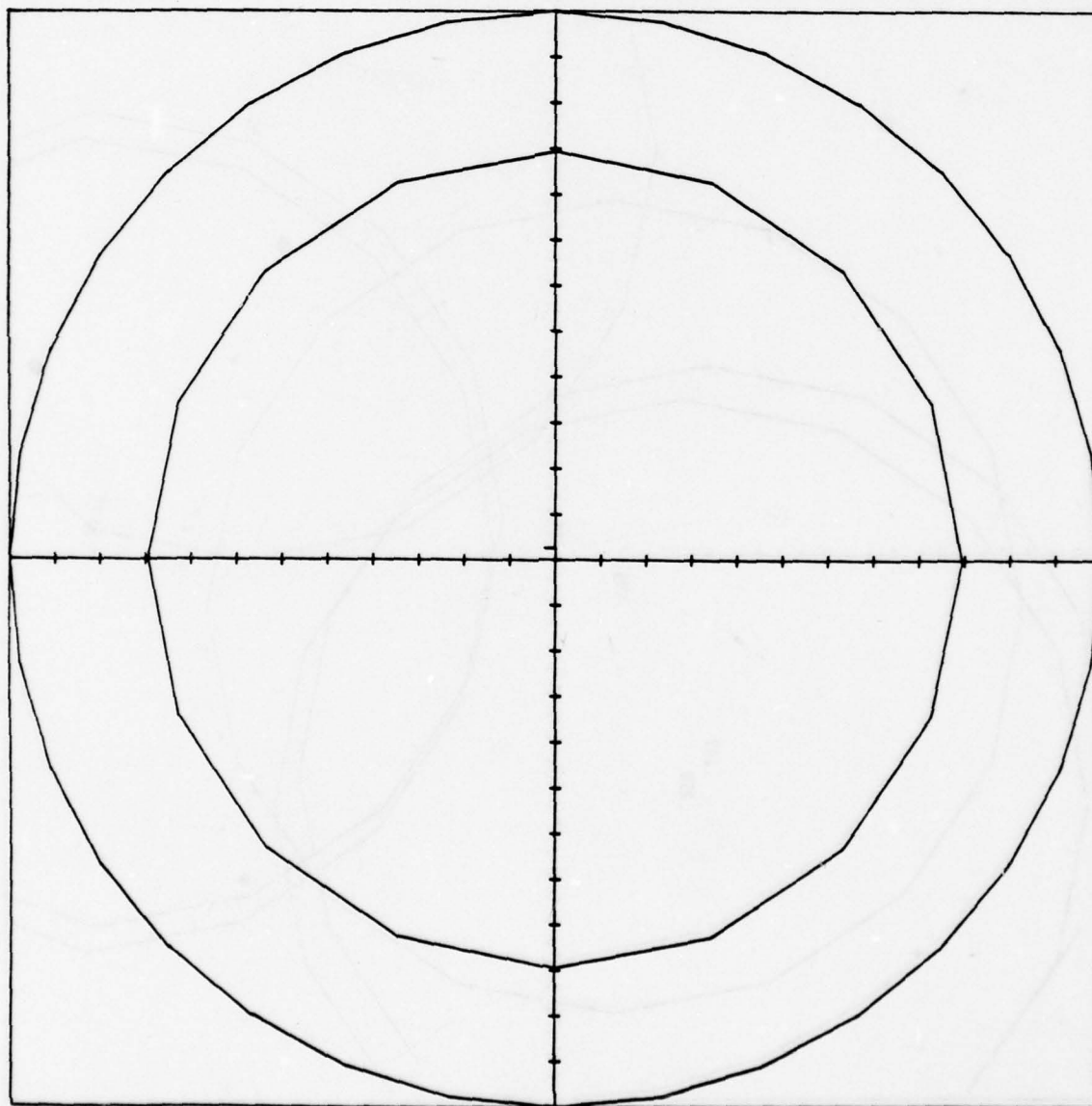
B H M

BIRMINGHAM, ALA.

IR 1001 J  
S.L. OF REED PHOTO. CO. 1.7213585

FILE # 1 USED AS BIRMINGHAM SITE

GROUP # 1 BIRMINGHAM 100  
\*\*\*\* \*\*





BNA

NASHVILLE, TENN.

W. L. 4000 G. 13.5 F. 1010.88.44271  
S. L. E. OF AREA F. 1010.88.44271

FILE # 600 USED AS HORIZONTAL SITE

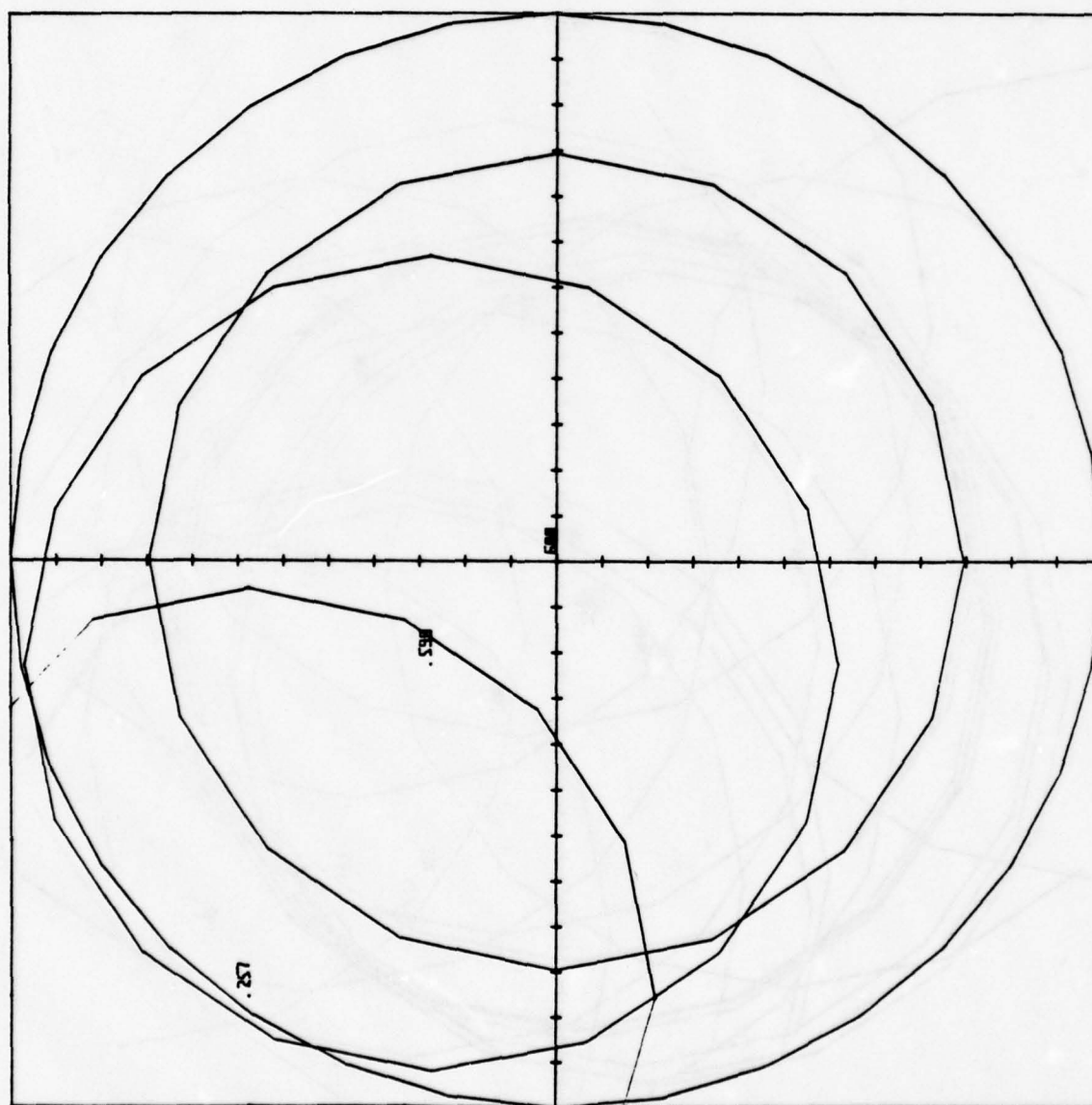
FRONT # 10 WITHIN 102.3015149  
FRONT # 15 WITHIN 100.512536  
FRONT # 25 WITHIN 98.5188208  
FRONT # 35 WITHIN 96.52715124  
FRONT # 45 WITHIN 94.53548168  
FRONT # 55 WITHIN 92.54381312  
FRONT # 65 WITHIN 90.55214456  
FRONT # 75 WITHIN 88.560476  
FRONT # 85 WITHIN 86.56880744  
FRONT # 95 WITHIN 84.57713888  
FRONT # 100 WITHIN 82.58547032  
FRONT # 105 WITHIN 80.59380176  
FRONT # 110 WITHIN 78.6021332  
FRONT # 115 WITHIN 76.61046464  
FRONT # 120 WITHIN 74.61879608  
FRONT # 125 WITHIN 72.62712752  
FRONT # 130 WITHIN 70.63545896  
FRONT # 135 WITHIN 68.6437904  
FRONT # 140 WITHIN 66.65212184  
FRONT # 145 WITHIN 64.66045328  
FRONT # 150 WITHIN 62.66878472  
FRONT # 155 WITHIN 60.67711616  
FRONT # 160 WITHIN 58.6854476  
FRONT # 165 WITHIN 56.69377904  
FRONT # 170 WITHIN 54.70211048  
FRONT # 175 WITHIN 52.71044192  
FRONT # 180 WITHIN 50.71877336  
FRONT # 185 WITHIN 48.7271048  
FRONT # 190 WITHIN 46.73543624  
FRONT # 195 WITHIN 44.74376768  
FRONT # 200 WITHIN 42.75209912  
FRONT # 205 WITHIN 40.76043056  
FRONT # 210 WITHIN 38.768762  
FRONT # 215 WITHIN 36.77709344  
FRONT # 220 WITHIN 34.78542488  
FRONT # 225 WITHIN 32.79375632  
FRONT # 230 WITHIN 30.80208776  
FRONT # 235 WITHIN 28.8104192  
FRONT # 240 WITHIN 26.81875064  
FRONT # 245 WITHIN 24.82708208  
FRONT # 250 WITHIN 22.83541352  
FRONT # 255 WITHIN 20.84374496  
FRONT # 260 WITHIN 18.8520764  
FRONT # 265 WITHIN 16.86040784  
FRONT # 270 WITHIN 14.86873928  
FRONT # 275 WITHIN 12.87707072  
FRONT # 280 WITHIN 10.88540216  
FRONT # 285 WITHIN 8.8937336  
FRONT # 290 WITHIN 6.90206504  
FRONT # 295 WITHIN 4.91039648  
FRONT # 300 WITHIN 2.91872792  
FRONT # 305 WITHIN 0.92705936  
FRONT # 310 WITHIN -1.06461184  
FRONT # 315 WITHIN -3.07294328  
FRONT # 320 WITHIN -5.08127472  
FRONT # 325 WITHIN -7.08960616  
FRONT # 330 WITHIN -9.0979376  
FRONT # 335 WITHIN -11.10626904  
FRONT # 340 WITHIN -13.11460048  
FRONT # 345 WITHIN -15.12293192  
FRONT # 350 WITHIN -17.13126336  
FRONT # 355 WITHIN -19.1395948  
FRONT # 360 WITHIN -21.14792624  
FRONT # 365 WITHIN -23.15625768  
FRONT # 370 WITHIN -25.16458912  
FRONT # 375 WITHIN -27.17292056  
FRONT # 380 WITHIN -29.181252  
FRONT # 385 WITHIN -31.18958344  
FRONT # 390 WITHIN -33.19791488  
FRONT # 395 WITHIN -35.20624632  
FRONT # 400 WITHIN -37.21457776  
FRONT # 405 WITHIN -39.2229092  
FRONT # 410 WITHIN -41.23124064  
FRONT # 415 WITHIN -43.23957208  
FRONT # 420 WITHIN -45.24790352  
FRONT # 425 WITHIN -47.25623496  
FRONT # 430 WITHIN -49.2645664  
FRONT # 435 WITHIN -51.27289784  
FRONT # 440 WITHIN -53.28122928  
FRONT # 445 WITHIN -55.28956072  
FRONT # 450 WITHIN -57.29789216  
FRONT # 455 WITHIN -59.3062236  
FRONT # 460 WITHIN -61.31455504  
FRONT # 465 WITHIN -63.32288648  
FRONT # 470 WITHIN -65.33121792  
FRONT # 475 WITHIN -67.33954936  
FRONT # 480 WITHIN -69.3478808  
FRONT # 485 WITHIN -71.35621224  
FRONT # 490 WITHIN -73.36454368  
FRONT # 495 WITHIN -75.37287512  
FRONT # 500 WITHIN -77.38120656  
FRONT # 505 WITHIN -79.389538  
FRONT # 510 WITHIN -81.39786944  
FRONT # 515 WITHIN -83.40620088  
FRONT # 520 WITHIN -85.41453232  
FRONT # 525 WITHIN -87.42286376  
FRONT # 530 WITHIN -89.4311952  
FRONT # 535 WITHIN -91.43952664  
FRONT # 540 WITHIN -93.44785808  
FRONT # 545 WITHIN -95.45618952  
FRONT # 550 WITHIN -97.46452096  
FRONT # 555 WITHIN -99.4728524  
FRONT # 560 WITHIN -101.48118384  
FRONT # 565 WITHIN -103.48951528  
FRONT # 570 WITHIN -105.49784672  
FRONT # 575 WITHIN -107.50617816  
FRONT # 580 WITHIN -109.5145096  
FRONT # 585 WITHIN -111.52284104  
FRONT # 590 WITHIN -113.53117248  
FRONT # 595 WITHIN -115.53950392  
FRONT # 600 WITHIN -117.54783536  
FRONT # 605 WITHIN -119.5561668  
FRONT # 610 WITHIN -121.56449824  
FRONT # 615 WITHIN -123.57282968  
FRONT # 620 WITHIN -125.58116112  
FRONT # 625 WITHIN -127.58949256  
FRONT # 630 WITHIN -129.597824  
FRONT # 635 WITHIN -131.60615544  
FRONT # 640 WITHIN -133.61448688  
FRONT # 645 WITHIN -135.62281832  
FRONT # 650 WITHIN -137.63114976  
FRONT # 655 WITHIN -139.6394812  
FRONT # 660 WITHIN -141.64781264  
FRONT # 665 WITHIN -143.65614408  
FRONT # 670 WITHIN -145.66447552  
FRONT # 675 WITHIN -147.67280696  
FRONT # 680 WITHIN -149.6811384  
FRONT # 685 WITHIN -151.68946984  
FRONT # 690 WITHIN -153.69780128  
FRONT # 695 WITHIN -155.70613272  
FRONT # 700 WITHIN -157.71446416  
FRONT # 705 WITHIN -159.7227956  
FRONT # 710 WITHIN -161.73112704  
FRONT # 715 WITHIN -163.73945848  
FRONT # 720 WITHIN -165.74778992  
FRONT # 725 WITHIN -167.75612136  
FRONT # 730 WITHIN -169.7644528  
FRONT # 735 WITHIN -171.77278424  
FRONT # 740 WITHIN -173.78111568  
FRONT # 745 WITHIN -175.78944712  
FRONT # 750 WITHIN -177.79777856  
FRONT # 755 WITHIN -179.80611  
FRONT # 760 WITHIN -181.81444144  
FRONT # 765 WITHIN -183.82277288  
FRONT # 770 WITHIN -185.83110432  
FRONT # 775 WITHIN -187.83943576  
FRONT # 780 WITHIN -189.8477672  
FRONT # 785 WITHIN -191.85609864  
FRONT # 790 WITHIN -193.86443008  
FRONT # 795 WITHIN -195.87276152  
FRONT # 800 WITHIN -197.88109296  
FRONT # 805 WITHIN -199.8894244  
FRONT # 810 WITHIN -201.89775584  
FRONT # 815 WITHIN -203.90608728  
FRONT # 820 WITHIN -205.91441872  
FRONT # 825 WITHIN -207.92275016  
FRONT # 830 WITHIN -209.9310816  
FRONT # 835 WITHIN -211.93941304  
FRONT # 840 WITHIN -213.94774448  
FRONT # 845 WITHIN -215.95607592  
FRONT # 850 WITHIN -217.96440736  
FRONT # 855 WITHIN -219.9727388  
FRONT # 860 WITHIN -221.98107024  
FRONT # 865 WITHIN -223.98940168  
FRONT # 870 WITHIN -225.99773312  
FRONT # 875 WITHIN -227.00606456  
FRONT # 880 WITHIN -229.014396  
FRONT # 885 WITHIN -231.02272744  
FRONT # 890 WITHIN -233.03105888  
FRONT # 895 WITHIN -235.03939032  
FRONT # 900 WITHIN -237.04772176  
FRONT # 905 WITHIN -239.0560532  
FRONT # 910 WITHIN -241.06438464  
FRONT # 915 WITHIN -243.07271608  
FRONT # 920 WITHIN -245.08104752  
FRONT # 925 WITHIN -247.08937896  
FRONT # 930 WITHIN -249.0977104  
FRONT # 935 WITHIN -251.10604184  
FRONT # 940 WITHIN -253.11437328  
FRONT # 945 WITHIN -255.12270472  
FRONT # 950 WITHIN -257.13103616  
FRONT # 955 WITHIN -259.1393676  
FRONT # 960 WITHIN -261.14769904  
FRONT # 965 WITHIN -263.15603048  
FRONT # 970 WITHIN -265.16436192  
FRONT # 975 WITHIN -267.17269336  
FRONT # 980 WITHIN -269.1810248  
FRONT # 985 WITHIN -271.18935624  
FRONT # 990 WITHIN -273.19768768  
FRONT # 995 WITHIN -275.20601912  
FRONT # 1000 WITHIN -277.21435056  
FRONT # 1005 WITHIN -279.222682  
FRONT # 1010 WITHIN -281.23101344  
FRONT # 1015 WITHIN -283.23934488  
FRONT # 1020 WITHIN -285.24767632  
FRONT # 1025 WITHIN -287.25600776  
FRONT # 1030 WITHIN -289.2643392  
FRONT # 1035 WITHIN -291.27267064  
FRONT # 1040 WITHIN -293.28100208  
FRONT # 1045 WITHIN -295.28933352  
FRONT # 1050 WITHIN -297.29766496  
FRONT # 1055 WITHIN -299.3059964  
FRONT # 1060 WITHIN -301.31432784  
FRONT # 1065 WITHIN -303.32265928  
FRONT # 1070 WITHIN -305.33099072  
FRONT # 1075 WITHIN -307.33932216  
FRONT # 1080 WITHIN -309.3476536  
FRONT # 1085 WITHIN -311.35598504  
FRONT # 1090 WITHIN -313.36431648  
FRONT # 1095 WITHIN -315.37264792  
FRONT # 1100 WITHIN -317.38097936  
FRONT # 1105 WITHIN -319.3893108  
FRONT # 1110 WITHIN -321.39764224  
FRONT # 1115 WITHIN -323.40597368  
FRONT # 1120 WITHIN -325.41430512  
FRONT # 1125 WITHIN -327.42263656  
FRONT # 1130 WITHIN -329.430968  
FRONT # 1135 WITHIN -331.43929944  
FRONT # 1140 WITHIN -333.44763088  
FRONT # 1145 WITHIN -335.45596232  
FRONT # 1150 WITHIN -337.46429376  
FRONT # 1155 WITHIN -339.4726252  
FRONT # 1160 WITHIN -341.48095664  
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FRONT # 1170 WITHIN -345.49761952  
FRONT # 1175 WITHIN -347.50595096  
FRONT # 1180 WITHIN -349.5142824  
FRONT # 1185 WITHIN -351.52261384  
FRONT # 1190 WITHIN -353.53094528  
FRONT # 1195 WITHIN -355.53927672  
FRONT # 1200 WITHIN -357.54760816  
FRONT # 1205 WITHIN -359.5559396  
FRONT # 1210 WITHIN -361.56427104  
FRONT # 1215 WITHIN -363.57260248  
FRONT # 1220 WITHIN -365.58093392  
FRONT # 1225 WITHIN -367.58926536  
FRONT # 1230 WITHIN -369.5975968  
FRONT # 1235 WITHIN -371.60592824  
FRONT # 1240 WITHIN -373.61425968  
FRONT # 1245 WITHIN -375.62259112  
FRONT # 1250 WITHIN -377.63092256  
FRONT # 1255 WITHIN -379.639254  
FRONT # 1260 WITHIN -381.64758544  
FRONT # 1265 WITHIN -383.65591688  
FRONT # 1270 WITHIN -385.66424832  
FRONT # 1275 WITHIN -387.67257976  
FRONT # 1280 WITHIN -389.6809112  
FRONT # 1285 WITHIN -391.68924264  
FRONT # 1290 WITHIN -393.69757408  
FRONT # 1295 WITHIN -395.70590552  
FRONT # 1300 WITHIN -397.71423696  
FRONT # 1305 WITHIN -399.7225684  
FRONT # 1310 WITHIN -401.73089984  
FRONT # 1315 WITHIN -403.73923128  
FRONT # 1320 WITHIN -405.74756272  
FRONT # 1325 WITHIN -407.75589416  
FRONT # 1330 WITHIN -409.7642256  
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FRONT # 1340 WITHIN -413.78088848  
FRONT # 1345 WITHIN -415.78921992  
FRONT # 1350 WITHIN -417.79755136  
FRONT # 1355 WITHIN -419.8058828  
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FRONT # 1365 WITHIN -423.82254568  
FRONT # 1370 WITHIN -425.83087712  
FRONT # 1375 WITHIN -427.83920856  
FRONT # 1380 WITHIN -429.84754  
FRONT # 1385 WITHIN -431.85587144  
FRONT # 1390 WITHIN -433.86420288  
FRONT # 1395 WITHIN -435.87253432  
FRONT # 1400 WITHIN -437.88086576  
FRONT # 1405 WITHIN -439.8891972  
FRONT # 1410 WITHIN -441.89752864  
FRONT # 1415 WITHIN -443.90586008  
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FRONT # 1425 WITHIN -447.92252296  
FRONT # 1430 WITHIN -449.9308544  
FRONT # 1435 WITHIN -451.93918584  
FRONT # 1440 WITHIN -453.94751728  
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FRONT # 1450 WITHIN -457.96418016  
FRONT # 1455 WITHIN -459.9725116  
FRONT # 1460 WITHIN -461.98084304  
FRONT # 1465 WITHIN -463.98917448  
FRONT # 1470 WITHIN -465.99750592  
FRONT # 1475 WITHIN -467.00583736  
FRONT # 1480 WITHIN -469.0141688  
FRONT # 1485 WITHIN -471.02250024  
FRONT # 1490 WITHIN -473.03083168  
FRONT # 1495 WITHIN -475.03916312  
FRONT # 1500 WITHIN -477.04749456  
FRONT # 1505 WITHIN -479.055826  
FRONT # 1510 WITHIN -481.06415744  
FRONT # 1515 WITHIN -483.07248888  
FRONT # 1520 WITHIN -485.08082032  
FRONT # 1525 WITHIN -487.08915176  
FRONT # 1530 WITHIN -489.0974832  
FRONT # 1535 WITHIN -491.10581464  
FRONT # 1540 WITHIN -493.11414608  
FRONT # 1545 WITHIN -495.12247752  
FRONT # 1550 WITHIN -497.13080896  
FRONT # 1555 WITHIN -499.1391404  
FRONT # 1560 WITHIN -501.14747184  
FRONT # 1565 WITHIN -503.15580328  
FRONT # 1570 WITHIN -505.16413472  
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FRONT # 1585 WITHIN -511.18912904  
FRONT # 1590 WITHIN -513.19746048  
FRONT # 1595 WITHIN -515.20579192  
FRONT # 1600 WITHIN -517.21412336  
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FRONT # 1610 WITHIN -521.23078624  
FRONT # 1615 WITHIN -523.23911768  
FRONT # 1620 WITHIN -525.24744912  
FRONT # 1625 WITHIN -527.25578056  
FRONT # 1630 WITHIN -529.264112  
FRONT # 1635 WITHIN -531.27244344  
FRONT # 1640 WITHIN -533.28077488  
FRONT # 1645 WITHIN -535.28910632  
FRONT # 1650 WITHIN -537.29743776  
FRONT # 1655 WITHIN -539.3057692  
FRONT # 1660 WITHIN -541.31410064  
FRONT # 1665 WITHIN -543.32243208  
FRONT # 1670 WITHIN -545.33076352  
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FRONT # 1680 WITHIN -549.3474264  
FRONT # 1685 WITHIN -551.35575784  
FRONT # 1690 WITHIN -553.36408928  
FRONT # 1695 WITHIN -555.37242072  
FRONT # 1700 WITHIN -557.38075216  
FRONT # 1705 WITHIN -559.3890836  
FRONT # 1710 WITHIN -561.39741504  
FRONT # 1715 WITHIN -563.40574648  
FRONT # 1720 WITHIN -565.41407792  
FRONT # 1725 WITHIN -567.42240936  
FRONT # 1730 WITHIN -569.4307408  
FRONT # 1735 WITHIN -571.43907224  
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FRONT # 1745 WITHIN -575.45573512  
FRONT # 1750 WITHIN -577.46406656  
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FRONT # 1760 WITHIN -581.48072944  
FRONT # 1765 WITHIN -583.48906088  
FRONT # 1770 WITHIN -585.49739232  
FRONT # 1775 WITHIN -587.50572376  
FRONT # 1780 WITHIN -589.5140552  
FRONT # 1785 WITHIN -591.52238664  
FRONT # 1790 WITHIN -593.53071808  
FRONT # 1795 WITHIN -595.53904952  
FRONT # 1800 WITHIN -597.54738096  
FRONT # 1805 WITHIN -599.5557124  
FRONT # 1810 WITHIN -601.56404384  
FRONT # 1815 WITHIN -603.57237528  
FRONT # 1820 WITHIN -605.58070672  
FRONT # 1825 WITHIN -607.58903816  
FRONT # 1830 WITHIN -609.5973696  
FRONT # 1835 WITHIN -611.60570104  
FRONT # 1840 WITHIN -613.61403248  
FRONT # 1845 WITHIN -615.62236392  
FRONT # 1850 WITHIN -617.63069536  
FRONT # 1855 WITHIN -619.6390268  
FRONT # 1860 WITHIN -621.64735824  
FRONT # 1865 WITHIN -623.65568968  
FRONT # 1870 WITHIN -625.66402112  
FRONT # 1875 WITHIN -627.67235256  
FRONT # 1880 WITHIN -629.680684  
FRONT # 1885 WITHIN -631.68901544  
FRONT # 1890 WITHIN -633.69734688  
FRONT # 1895 WITHIN -635.70567832  
FRONT # 1900 WITHIN -637.71400976  
FRONT # 1905 WITHIN -639.7223412  
FRONT # 1910 WITHIN -641.73067264  
FRONT # 1915 WITHIN -643.73900408  
FRONT # 1920 WITHIN -645.74733552  
FRONT # 1925 WITHIN -647.75566696  
FRONT # 1930 WITHIN -649.7639984  
FRONT # 1935 WITHIN -651.77232984  
FRONT # 1940 WITHIN -653.78066128  
FRONT # 1945 WITHIN -655.78899272  
FRONT # 1950 WITHIN -657.79732416  
FRONT # 1955 WITHIN -659.8056556  
FRONT # 1960 WITHIN -661.81398704  
FRONT # 1965 WITHIN -663.82231848  
FRONT # 1970 WITHIN -665.83064992  
FRONT # 1975 WITHIN -667.83898136  
FRONT # 1980 WITHIN -669.8473128  
FRONT # 1985 WITHIN -671.85564424  
FRONT # 1990 WITHIN -673.86397568  
FRONT # 1995 WITHIN -675.87230712  
FRONT # 2000 WITHIN -677.88063856  
FRONT # 2005 WITHIN -679.88897  
FRONT # 2010 WITHIN -681.89730144  
FRONT # 2015 WITHIN -683.90563288  
FRONT # 2020 WITHIN -685.91396432  
FRONT # 2025 WITHIN -687.92229576  
FRONT # 2030 WITHIN -689.9306272  
FRONT # 2035 WITHIN -691.93895864  
FRONT # 2040 WITHIN -693.94729008  
FRONT # 2045 WITHIN -695.95562152  
FRONT # 2050 WITHIN -697.96395296  
FRONT # 2055 WITHIN -699.9722844  
FRONT # 2060 WITHIN -701.98061584  
FRONT # 2065 WITHIN -703.98894728  
FRONT # 2070 WITHIN -705.99727872  
FRONT # 2075 WITHIN -707.00561016  
FRONT # 2080 WITHIN -709.0139416  
FRONT # 2085 WITHIN -711.02227304  
FRONT # 2090 WITHIN -713.03060448  
FRONT # 2095 WITHIN -715.03893592  
FRONT # 2100 WITHIN -717.04726736  
FRONT # 2105 WITHIN -719.0555988  
FRONT # 2110 WITHIN -721.06393024  
FRONT # 2115 WITHIN -723.07226168  
FRONT # 2120 WITHIN -725.08059312  
FRONT # 2125 WITHIN -727.08892456  
FRONT # 2130 WITHIN -729.097256  
FRONT # 2135 WITHIN -731.10558744  
FRONT # 2140 WITHIN -733.11391888  
FRONT # 2145 WITHIN -735.12225032  
FRONT # 2150 WITHIN -737.13058176  
FRONT # 2155 WITHIN -739.1389132  
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FRONT # 2190 WITHIN -753.19723328  
FRONT # 2195 WITHIN -755.20556472  
FRONT # 2200 WITHIN -757.21389616  
FRONT # 2205 WITHIN -759.2222276  
FRONT # 2210 WITHIN -761.23055904  
FRONT # 2215 WITHIN -763.23889048  
FRONT # 2220 WITHIN -765.24722192  
FRONT # 2225 WITHIN -767.25555336  
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FRONT # 2240 WITHIN -773.28054768  
FRONT # 2245 WITHIN -775.28887912  
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FRONT # 2255 WITHIN -779.305542  
FRONT # 2260 WITHIN -781.31387344  
FRONT # 2265 WITHIN -783.32220488  
FRONT # 2270 WITHIN -785.33053632  
FRONT # 2275 WITHIN -787.33886776  
FRONT # 2280 WITHIN -789.3471992  
FRONT # 2285 WITHIN -791.35553064  
FRONT # 2290 WITHIN -793.36386208  
FRONT # 2295 WITHIN -795.37219352  
FRONT # 2300 WITHIN -797.38052496  
FRONT # 2305 WITHIN -799.3888564  
FRONT # 2310 WITHIN -801.39718784  
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FRONT # 2320 WITHIN -805.41385072  
FRONT # 2325 WITHIN -807.42218216  
FRONT # 2330 WITHIN -809.4305136  
FRONT # 2335 WITHIN -811.43884504  
FRONT # 2340 WITHIN -813.44717648  
FRONT # 2345 WITHIN -815.45550792  
FRONT # 2350 WITHIN -817.46383936  
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FRONT # 2360 WITHIN -821.48050224  
FRONT # 2365 WITHIN -823.48883368  
FRONT # 2370 WITHIN -825.49716512  
FRONT # 2375 WITHIN -827.50549656  
FRONT # 2380 WITHIN -829.513828  
FRONT # 2385 WITHIN -831.52215944  
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FRONT # 2395 WITHIN -835.53882232  
FRONT # 2400 WITHIN -837.54715376  
FRONT # 2405 WITHIN -839.5554852  
FRONT # 2410 WITHIN -841.56381664  
FRONT # 2415 WITHIN -843.57214808  
FRONT # 2420 WITHIN -845.58047952  
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FRONT # 2435 WITHIN -851.60547384  
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FRONT # 2455 WITHIN -859.6387996  
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FRONT # 2495 WITHIN -875.70545112  
FRONT # 2500 WITHIN -877.71378256  
FRONT # 2505 WITHIN -879.722114  
FRONT # 2510 WITHIN -881.73044544  
FRONT # 2515 WITHIN -883.73877688  
FRONT # 2520 WITHIN -885.74710832  
FRONT # 2525 WITHIN -887.75543976  
FRONT # 2530 WITHIN -889.7637712  
FRONT # 2535 WITHIN -891.77210264  
FRONT # 2540 WITHIN -893.78043408  
FRONT # 2545 WITHIN -895.78876552  
FRONT # 2550 WITHIN -897.79709696  
FRONT # 2555 WITHIN -899.8054284  
FRONT # 2560 WITHIN -901.813759



BNA

NASHVILLE, TENN.

FLIGHT 1000 GIVES PHOTOS 44.7213  
L.E. OF AREA PHOTOS 44.7213  
FILE # 600 USED AS BODILIN SITE  
PHOTO # 257 WITHIN 58.5183008  
PHOTO # 594 WITHIN 17.7854000  
PHOTO # 600 WITHIN 0.0000000  
\*\*\* \*\*\*\*\*



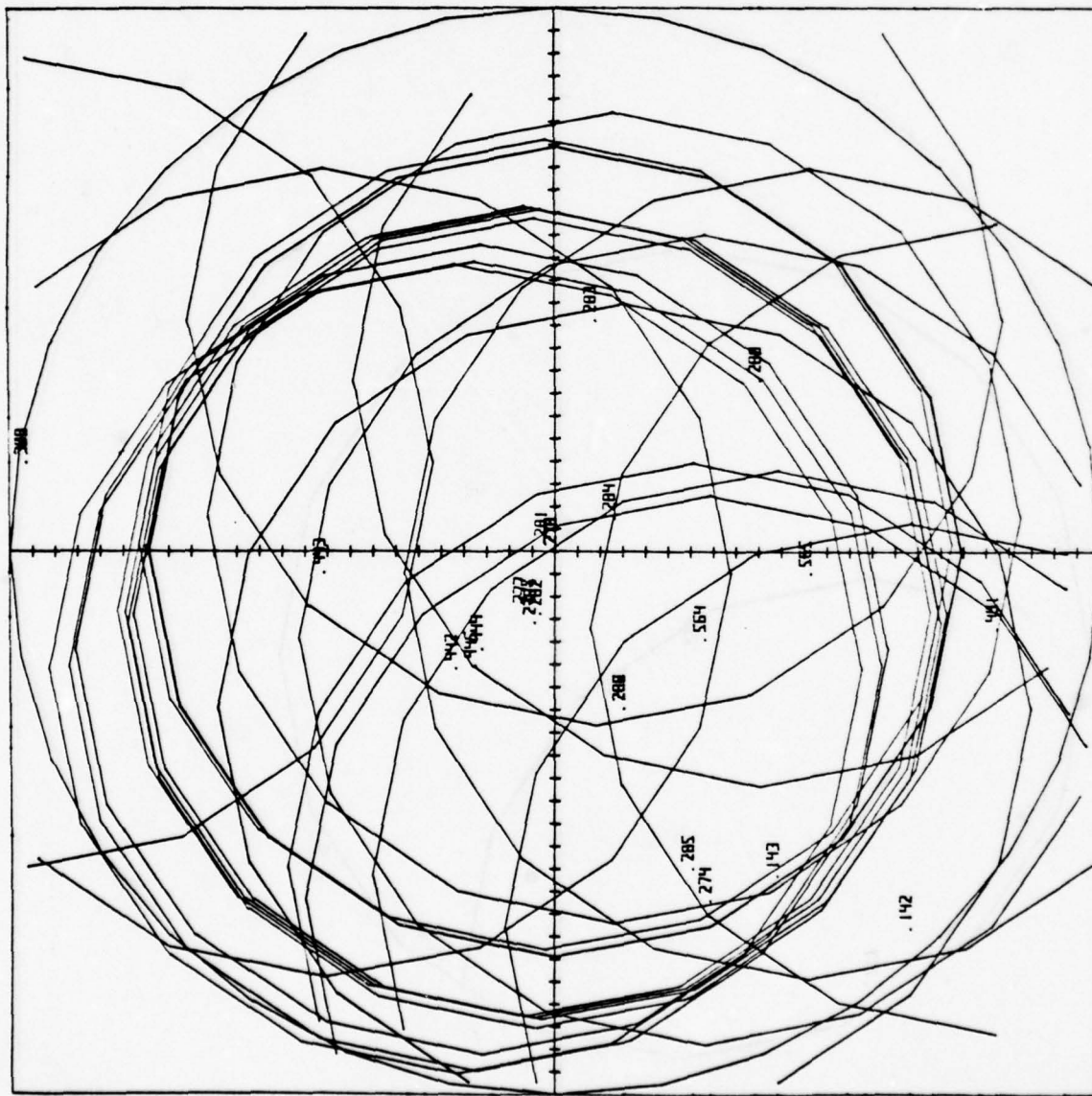


BOS

BOSTON, MASS.

HEIGHT 4000 GIVES EPOCHS 84.44271310  
 SITE OF NPER EPOCHS 100 120  
 FILE # 278 USED AS NOMINAL SITE

Epoch # 142	WITHIN 114.251372	0
Epoch # 143	WITHIN 86.824572	0
Epoch # 274	WITHIN 84.243491	0
Epoch # 275	WITHIN 14.243491	0
Epoch # 276	WITHIN 16.443491	0
Epoch # 277	WITHIN 14.806434	0
Epoch # 278	WITHIN 0	0
Epoch # 279	WITHIN 0.191411	0
Epoch # 280	WITHIN 58.986434	0
Epoch # 281	WITHIN 2.696434	0
Epoch # 282	WITHIN 14.103491	0
Epoch # 283	WITHIN 11.428500	0
Epoch # 284	WITHIN 15.103491	0
Epoch # 285	WITHIN 16.261500	0
Epoch # 286	WITHIN 37.804117	0
Epoch # 287	WITHIN 17.804117	0
Epoch # 288	WITHIN 11.704117	0
Epoch # 442	WITHIN 33.800305	0
Epoch # 443	WITHIN 50.825305	0
Epoch # 444	WITHIN 26.825305	0
Epoch # 445	WITHIN 30.671412	0
Epoch # 446	WITHIN 38.964434	0
Epoch # 504	WITHIN 38.489017	0
Epoch # 505	WITHIN 36.671412	0





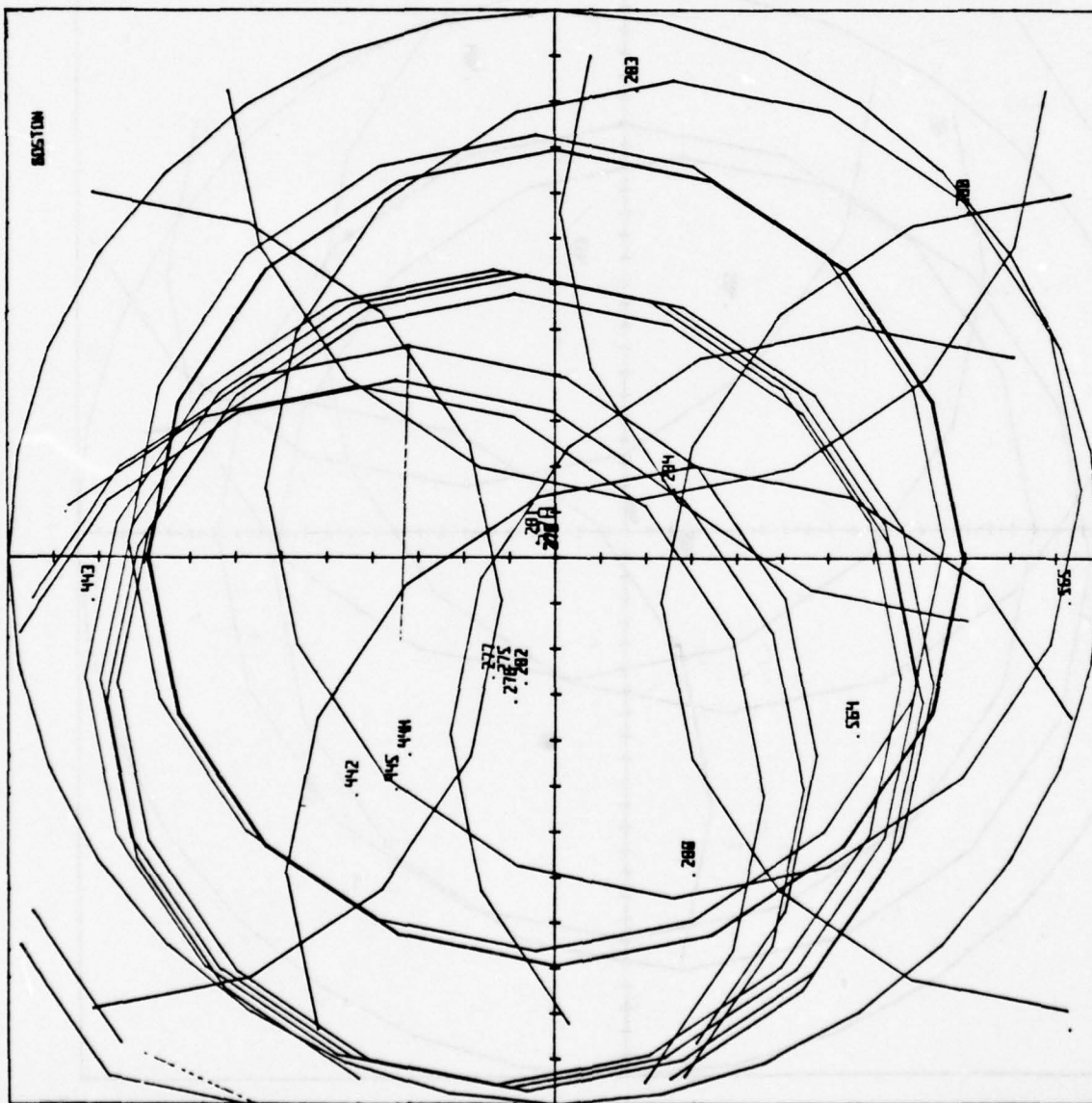
BOS

BOSTON, MASS.

DATE OF FILE: 11/14/55

FILE # 278 USED AS NORMAL SITE

FRONT # 279	WITHIN 14.8067958	NN
FRONT # 276	WITHIN 16.4322560	NN
FRONT # 277	WITHIN 14.8067941	NN
FRONT # 278	WITHIN 0	NN
FRONT # 279	WITHIN 0.17214113	NN
FRONT # 280	WITHIN 52.4563861	NN
FRONT # 281	WITHIN 7.001636127	NN
FRONT # 282	WITHIN 14.16239717	NN
FRONT # 283	WITHIN 51.8850623	NN
FRONT # 284	WITHIN 15.10300297	NN
FRONT # 285	WITHIN 27.3041717	NN
FRONT # 286	WITHIN 27.3041717	NN
FRONT # 443	WITHIN 31.00030524	NN
FRONT # 444	WITHIN 50.22539676	NN
FRONT # 445	WITHIN 26.85340177	NN
FRONT # 564	WITHIN 30.6714132	NN
FRONT # 565	WITHIN 38.48962774	NN
FRONT # 566	WITHIN 56.27167692	NN





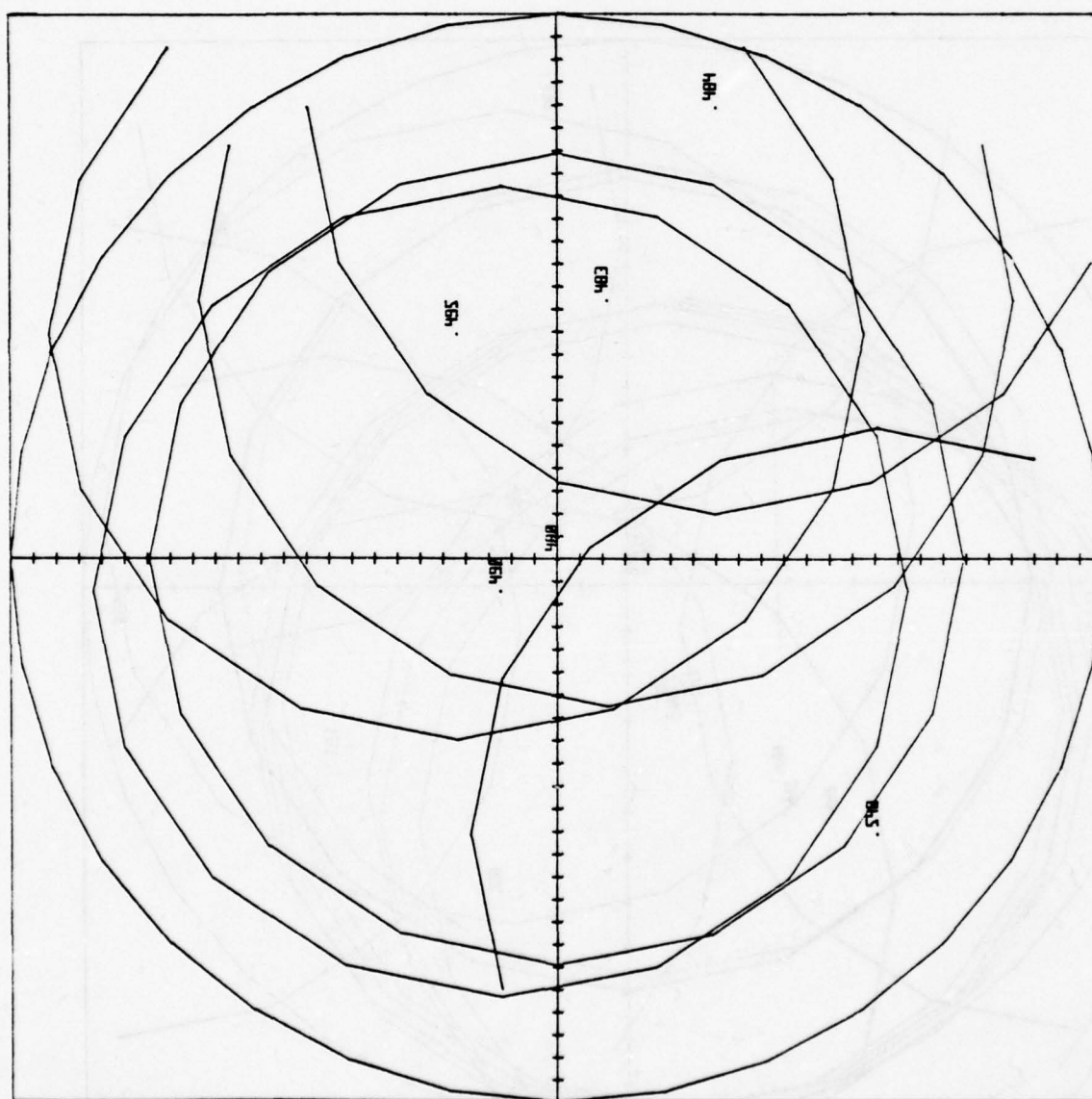
BUF

BUFFALO, N. Y.

BL 1000 4000 61905 680105 89.44271  
 LIE OF MEER 680105 680105 120

FILE # 480 USED AS 1000000 SITE

FRANK # 480 WITHIN 0 HH  
 FRANK # 483 WITHIN 50.00170222  
 FRANK # 484 WITHIN 100.00000000  
 FRANK # 485 WITHIN 14.00000000  
 FRANK # 486 WITHIN 54.00000000  
 FRANK # 547 WITHIN 93.00154684  
 FRANK # 548 WITHIN 93.00154684  
 \*\*\*\* \*\*\*\*\*





BUF

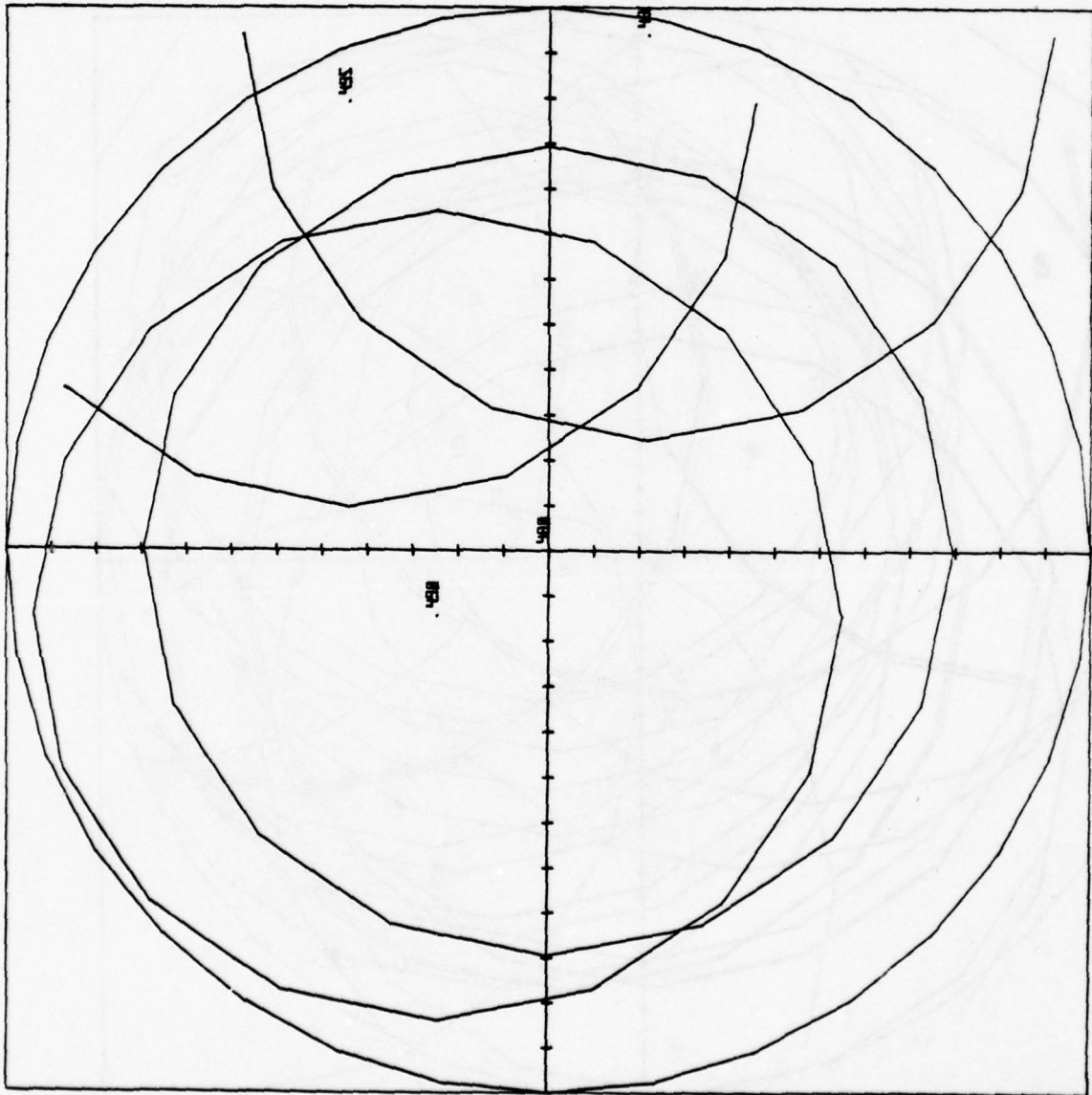
BUFFALO, N. Y.

7215595

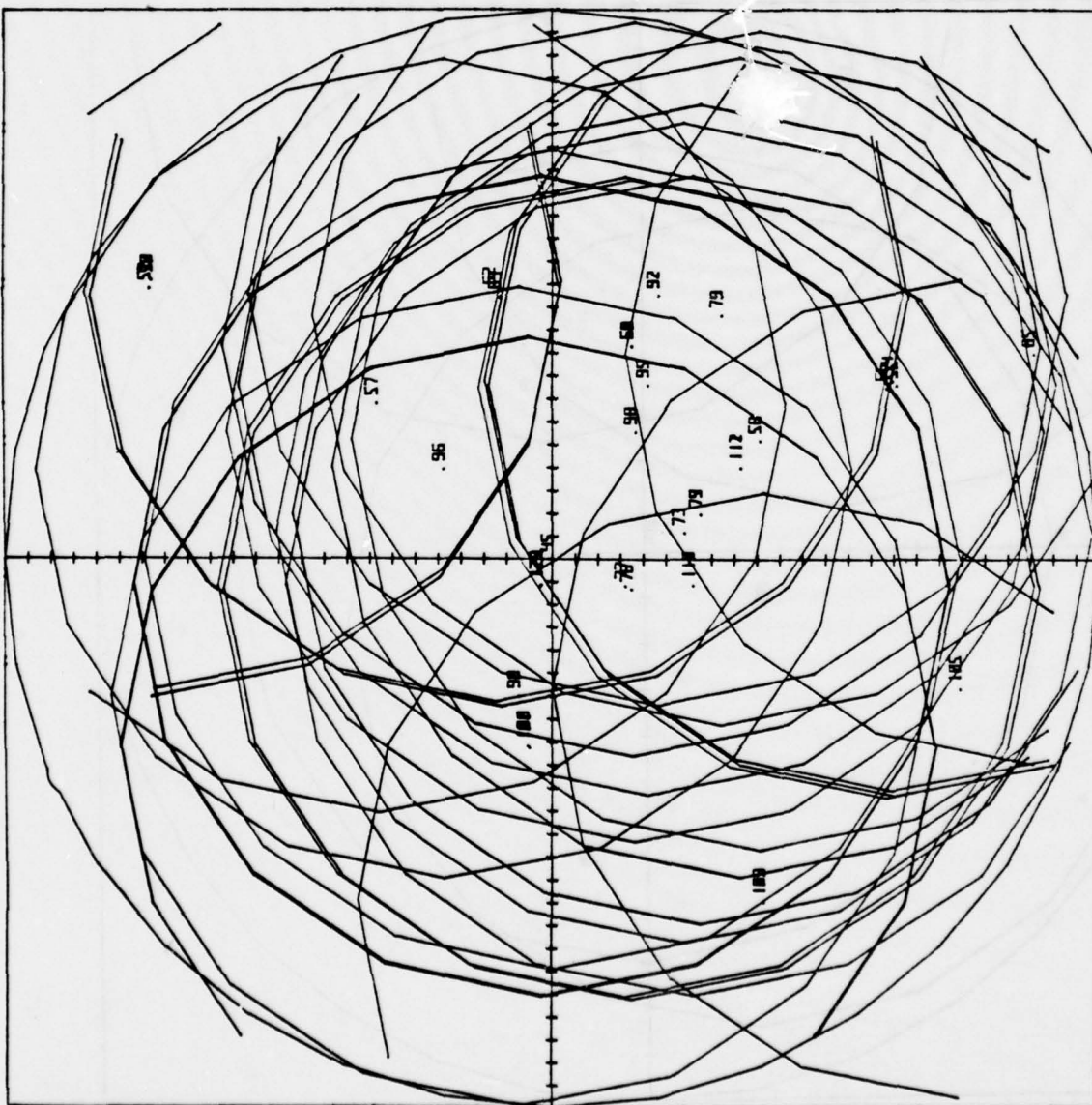
IN LUM  
SITE OF OPEN SPACE

FILE # 430 USED AS BOUNDARY SITE

PHOTO # 430 WITHIN 3 MM  
PHOTO # 433 WITHIN 58.011-022 MM  
PHOTO # 430 WITHIN 14.000-000 MM  
PHOTO # 430 WITHIN 14.000-000 MM







BUR

BURBANK, CALIF.

BRIGHT 4444 GIVE 5 POUNDS 89.44271918  
 SIZE OF AREA POUNDS 100.120  
 FILE # 45 USED AS NORMAL SITE

FRONT # 45	WITHIN 100.6080172	HP
FRONT # 50	WITHIN 100.6160027	HP
FRONT # 51	WITHIN 100.6160027	HP
FRONT # 52	WITHIN 100.6160027	HP
FRONT # 53	WITHIN 100.6160027	HP
FRONT # 54	WITHIN 100.6160027	HP
FRONT # 55	WITHIN 100.6160027	HP
FRONT # 56	WITHIN 100.6160027	HP
FRONT # 57	WITHIN 100.6160027	HP
FRONT # 58	WITHIN 100.6160027	HP
FRONT # 59	WITHIN 100.6160027	HP
FRONT # 60	WITHIN 100.6160027	HP
FRONT # 61	WITHIN 100.6160027	HP
FRONT # 62	WITHIN 100.6160027	HP
FRONT # 63	WITHIN 100.6160027	HP
FRONT # 64	WITHIN 100.6160027	HP
FRONT # 65	WITHIN 100.6160027	HP
FRONT # 66	WITHIN 100.6160027	HP
FRONT # 67	WITHIN 100.6160027	HP
FRONT # 68	WITHIN 100.6160027	HP
FRONT # 69	WITHIN 100.6160027	HP
FRONT # 70	WITHIN 100.6160027	HP
FRONT # 71	WITHIN 100.6160027	HP
FRONT # 72	WITHIN 100.6160027	HP
FRONT # 73	WITHIN 100.6160027	HP
FRONT # 74	WITHIN 100.6160027	HP
FRONT # 75	WITHIN 100.6160027	HP
FRONT # 76	WITHIN 100.6160027	HP
FRONT # 77	WITHIN 100.6160027	HP
FRONT # 78	WITHIN 100.6160027	HP
FRONT # 79	WITHIN 100.6160027	HP
FRONT # 80	WITHIN 100.6160027	HP
FRONT # 81	WITHIN 100.6160027	HP
FRONT # 82	WITHIN 100.6160027	HP
FRONT # 83	WITHIN 100.6160027	HP
FRONT # 84	WITHIN 100.6160027	HP
FRONT # 85	WITHIN 100.6160027	HP
FRONT # 86	WITHIN 100.6160027	HP
FRONT # 87	WITHIN 100.6160027	HP
FRONT # 88	WITHIN 100.6160027	HP
FRONT # 89	WITHIN 100.6160027	HP
FRONT # 90	WITHIN 100.6160027	HP
FRONT # 91	WITHIN 100.6160027	HP
FRONT # 92	WITHIN 100.6160027	HP
FRONT # 93	WITHIN 100.6160027	HP
FRONT # 94	WITHIN 100.6160027	HP
FRONT # 95	WITHIN 100.6160027	HP
FRONT # 96	WITHIN 100.6160027	HP
FRONT # 97	WITHIN 100.6160027	HP
FRONT # 98	WITHIN 100.6160027	HP
FRONT # 99	WITHIN 100.6160027	HP
FRONT # 100	WITHIN 100.6160027	HP
FRONT # 101	WITHIN 100.6160027	HP
FRONT # 102	WITHIN 100.6160027	HP
FRONT # 103	WITHIN 100.6160027	HP
FRONT # 104	WITHIN 100.6160027	HP
FRONT # 105	WITHIN 100.6160027	HP
FRONT # 106	WITHIN 100.6160027	HP
FRONT # 107	WITHIN 100.6160027	HP
FRONT # 108	WITHIN 100.6160027	HP
FRONT # 109	WITHIN 100.6160027	HP
FRONT # 110	WITHIN 100.6160027	HP
FRONT # 111	WITHIN 100.6160027	HP
FRONT # 112	WITHIN 100.6160027	HP
FRONT # 113	WITHIN 100.6160027	HP
FRONT # 114	WITHIN 100.6160027	HP
FRONT # 115	WITHIN 100.6160027	HP
FRONT # 116	WITHIN 100.6160027	HP
FRONT # 117	WITHIN 100.6160027	HP
FRONT # 118	WITHIN 100.6160027	HP
FRONT # 119	WITHIN 100.6160027	HP
FRONT # 120	WITHIN 100.6160027	HP
FRONT # 121	WITHIN 100.6160027	HP
FRONT # 122	WITHIN 100.6160027	HP
FRONT # 123	WITHIN 100.6160027	HP
FRONT # 124	WITHIN 100.6160027	HP
FRONT # 125	WITHIN 100.6160027	HP



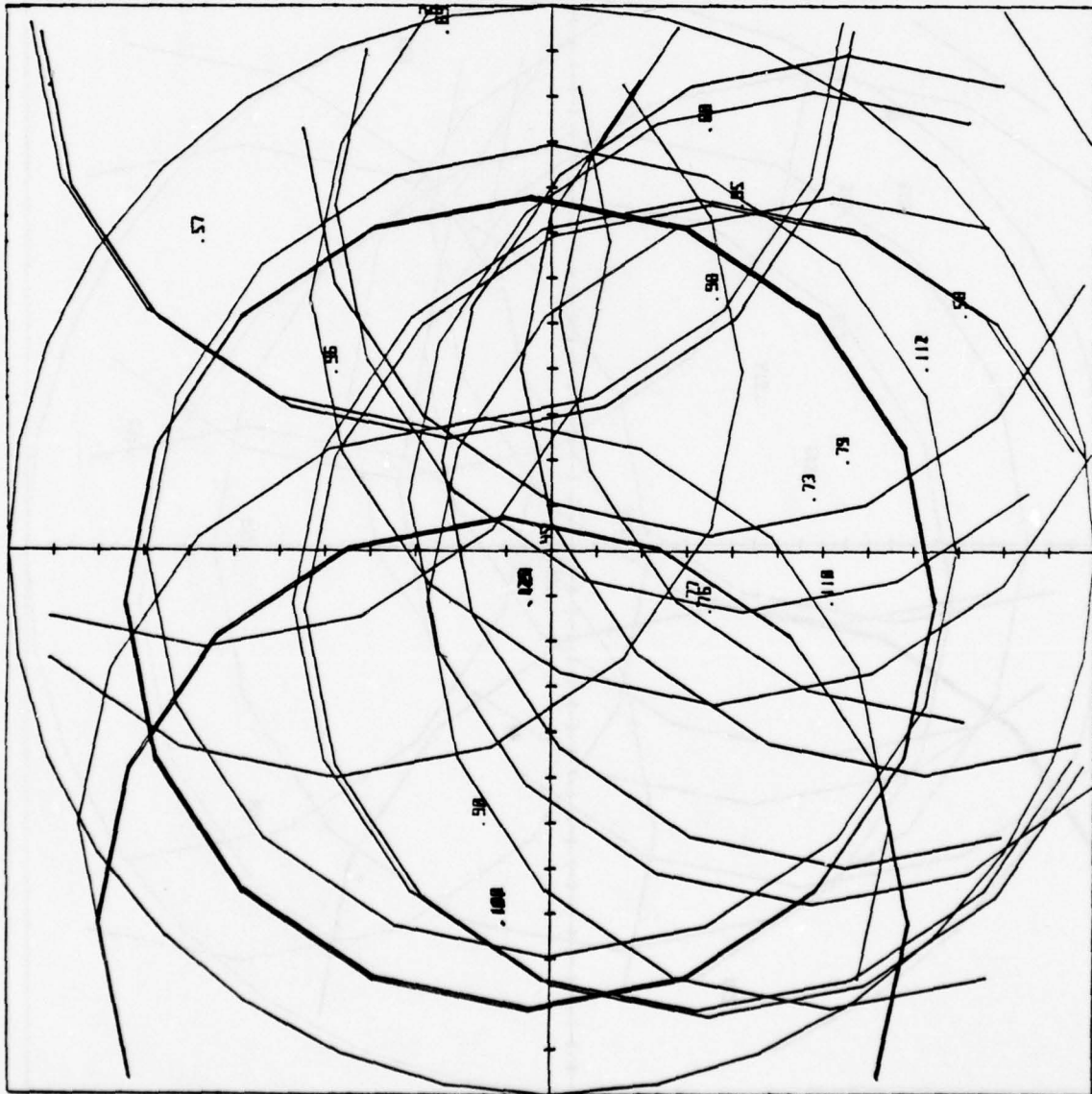
BUR

BURGANK, CALIF.

35955

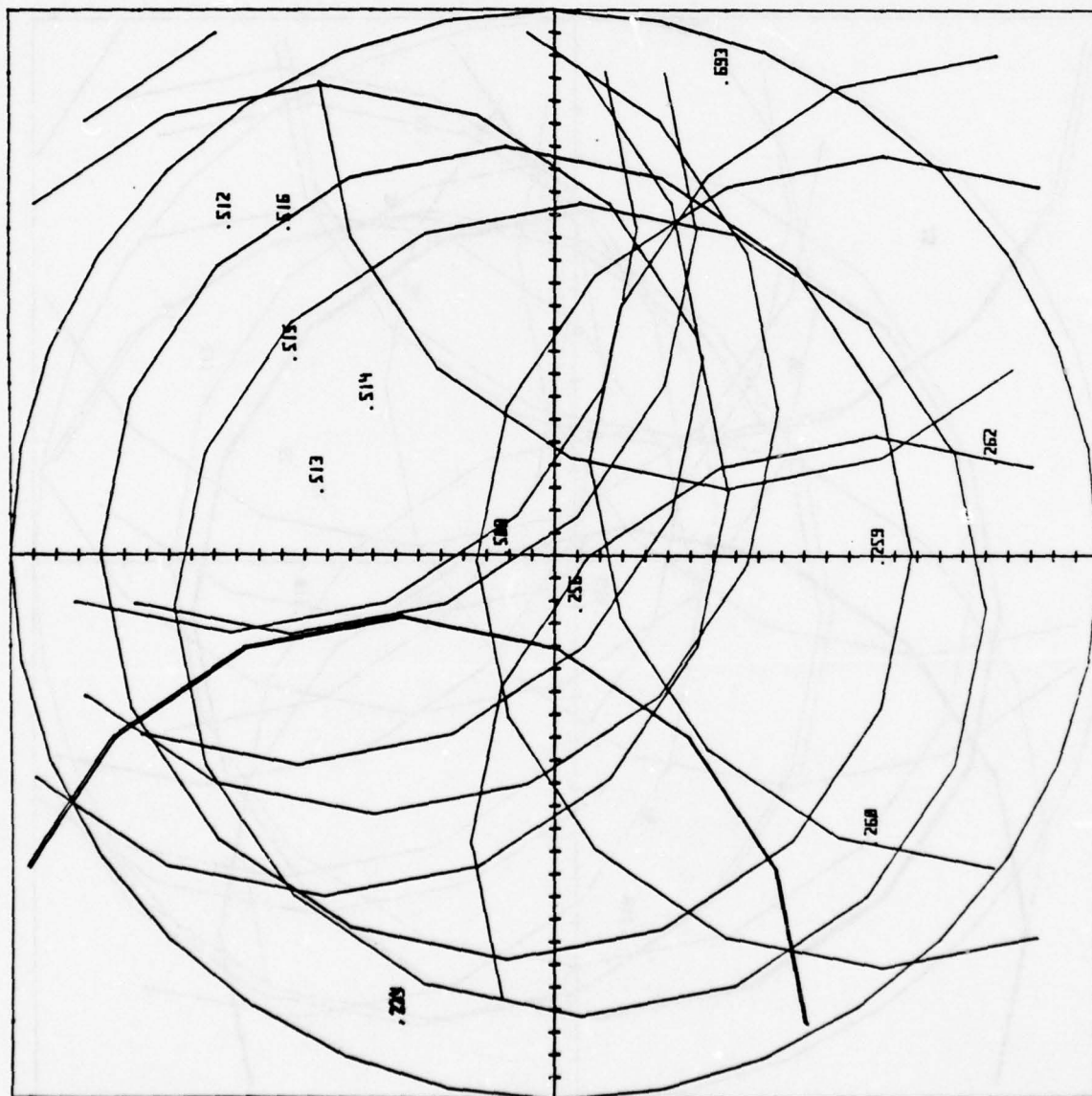
FILE # 45 USED AS HORIZONTAL SITE

Point #	Within 0	MM
Point # 45	51.1815629	MM
Point # 57	50.4274847	MM
Point # 58	49.66810826	MM
Point # 59	49.66810826	MM
Point # 60	49.66810826	MM
Point # 61	49.66810826	MM
Point # 62	49.66810826	MM
Point # 63	49.66810826	MM
Point # 64	49.66810826	MM
Point # 65	49.66810826	MM
Point # 66	49.66810826	MM
Point # 67	49.66810826	MM
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Point # 88	49.66810826	MM
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Point # 118	49.66810826	MM
Point # 119	49.66810826	MM
Point # 120	49.66810826	MM
Point # 121	49.66810826	MM
Point # 122	49.66810826	MM
Point # 123	49.66810826	MM
Point # 124	49.66810826	MM
Point # 125	49.66810826	MM





CIN  
CINCINNATI, OHIO



Light 4000 GIVES RADIUS 89.44271  
L.E. OF AREA (RADIUS (RM)) 120

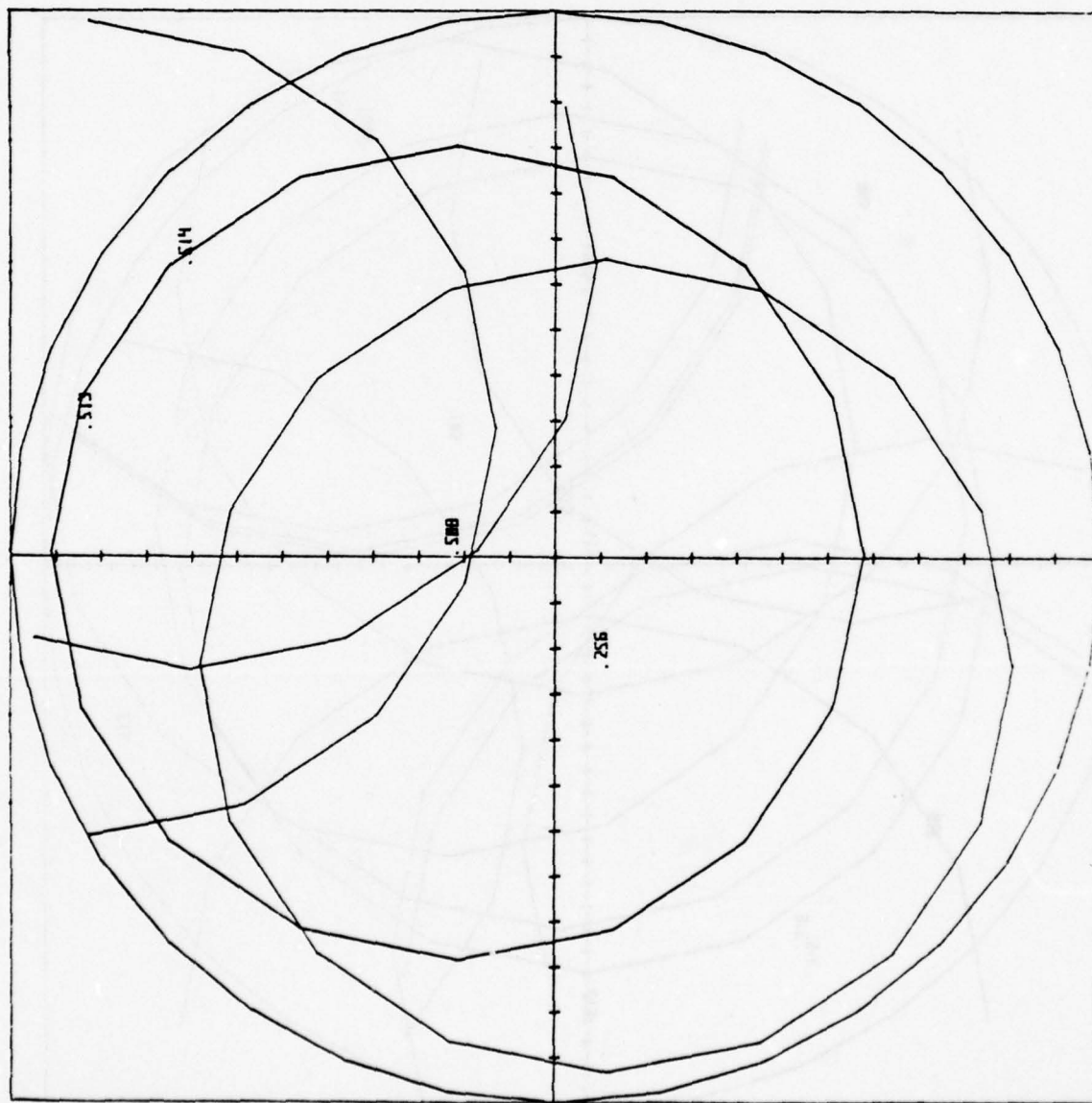
Light 4000 GIVES RADIUS 89.44271  
L.E. OF AREA (RADIUS (RM)) 120

ALL RADIUS=CLOSED AS NOMINAL SITE

Radius # 233	WITHIN 108.571075	RM
Radius # 234	WITHIN 108.571075	RM
Radius # 250	WITHIN 13.1751154	RM
Radius # 259	WITHIN 12.3243096	RM
Radius # 269	WITHIN 45.61649638	RM
Radius # 262	WITHIN 22.2628874	RM
Radius # 508	WITHIN 10.78124593	RM
Radius # 509	WITHIN 10.78124593	RM
Radius # 512	WITHIN 101.5899753	RM
Radius # 513	WITHIN 53.15226323	RM
Radius # 514	WITHIN 51.6116641	RM
Radius # 515	WITHIN 71.4583504	RM
Radius # 516	WITHIN 42.60370366	RM
Radius # 690	WITHIN 110.7974353	RM



CIN  
CINCINNATI, OHIO

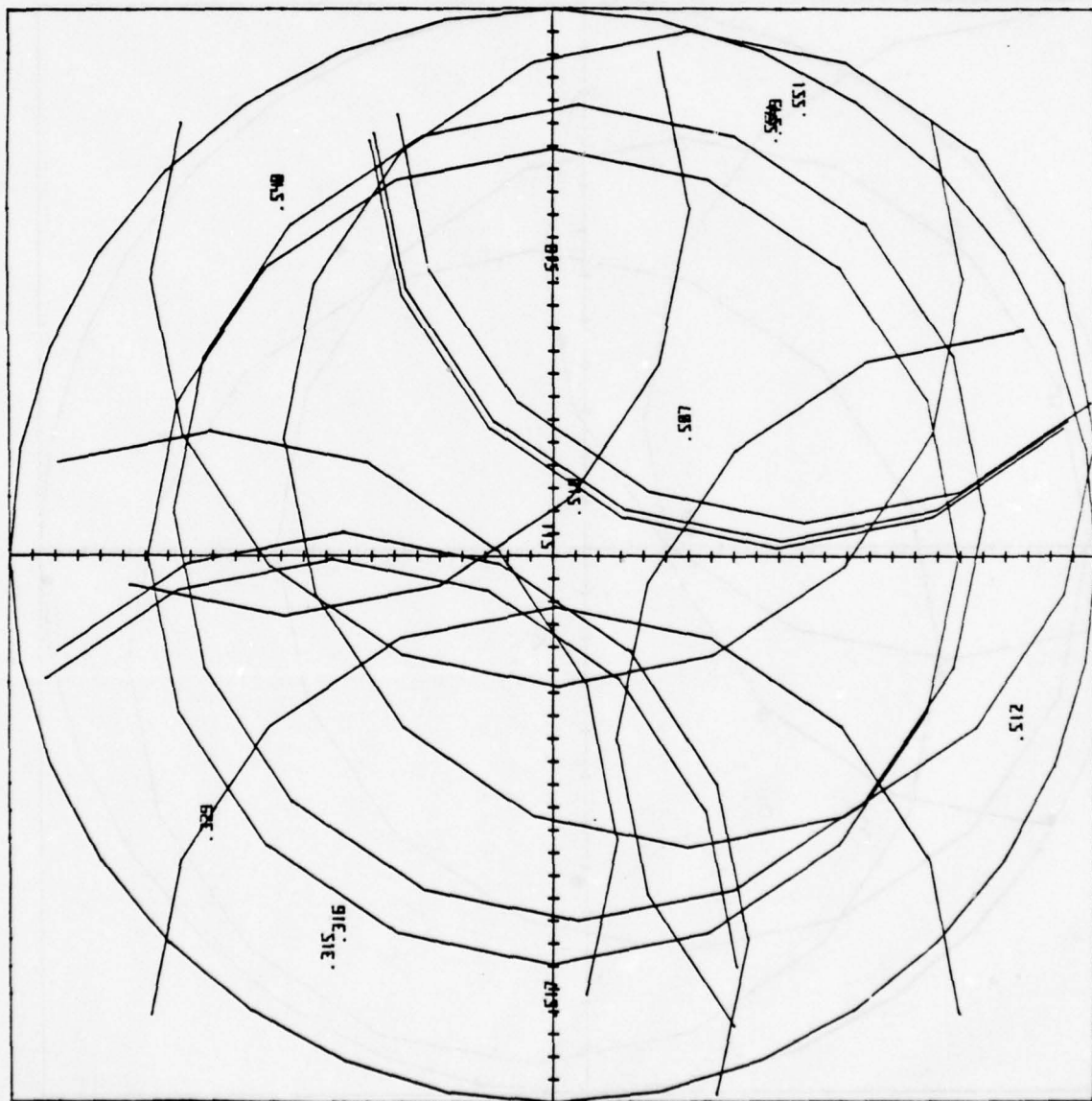


ALL DATA GIVEN IN THIS CASE  
 1. OF DATA GIVEN IN THIS CASE  
 2. MORE-CHAINED AND BOUNDARY SITE  
 3. 514 512 510 508 506 504 502 500 498 496 494 492 490 488 486 484 482 480 478 476 474 472 470 468 466 464 462 460 458 456 454 452 450 448 446 444 442 440 438 436 434 432 430 428 426 424 422 420 418 416 414 412 410 408 406 404 402 400 398 396 394 392 390 388 386 384 382 380 378 376 374 372 370 368 366 364 362 360 358 356 354 352 350 348 346 344 342 340 338 336 334 332 330 328 326 324 322 320 318 316 314 312 310 308 306 304 302 300 298 296 294 292 290 288 286 284 282 280 278 276 274 272 270 268 266 264 262 260 258 256 254 252 250 248 246 244 242 240 238 236 234 232 230 228 226 224 222 220 218 216 214 212 210 208 206 204 202 200 198 196 194 192 190 188 186 184 182 180 178 176 174 172 170 168 166 164 162 160 158 156 154 152 150 148 146 144 142 140 138 136 134 132 130 128 126 124 122 120 118 116 114 112 110 108 106 104 102 100 98 96 94 92 90 88 86 84 82 80 78 76 74 72 70 68 66 64 62 60 58 56 54 52 50 48 46 44 42 40 38 36 34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0  
 4. 514 512 510 508 506 504 502 500 498 496 494 492 490 488 486 484 482 480 478 476 474 472 470 468 466 464 462 460 458 456 454 452 450 448 446 444 442 440 438 436 434 432 430 428 426 424 422 420 418 416 414 412 410 408 406 404 402 400 398 396 394 392 390 388 386 384 382 380 378 376 374 372 370 368 366 364 362 360 358 356 354 352 350 348 346 344 342 340 338 336 334 332 330 328 326 324 322 320 318 316 314 312 310 308 306 304 302 300 298 296 294 292 290 288 286 284 282 280 278 276 274 272 270 268 266 264 262 260 258 256 254 252 250 248 246 244 242 240 238 236 234 232 230 228 226 224 222 220 218 216 214 212 210 208 206 204 202 200 198 196 194 192 190 188 186 184 182 180 178 176 174 172 170 168 166 164 162 160 158 156 154 152 150 148 146 144 142 140 138 136 134 132 130 128 126 124 122 120 118 116 114 112 110 108 106 104 102 100 98 96 94 92 90 88 86 84 82 80 78 76 74 72 70 68 66 64 62 60 58 56 54 52 50 48 46 44 42 40 38 36 34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0



CLE

CLEVELAND, OHIO



ALIGHT 4000 CLEPS RADIOS 09.442719  
 SIZE OF AREA RADIOS 0000 100

CLE # 511 USED AS NOMINAL SITE

FRONT # 315	WITHIN 100.436761	11
FRONT # 316	WITHIN 96.0003351	11
FRONT # 317	WITHIN 97.4963307	11
FRONT # 318	WITHIN 99.08410476	11
FRONT # 319	WITHIN 11.13438055	11
FRONT # 320	WITHIN 0	11
FRONT # 321	WITHIN 111.0306338	11
FRONT # 322	WITHIN 100.6174267	11
FRONT # 323	WITHIN 99.8827064	11
FRONT # 324	WITHIN 96.5950075	11
FRONT # 325	WITHIN 96.5950075	11
FRONT # 326	WITHIN 100.6174267	11
FRONT # 327	WITHIN 111.0306338	11
FRONT # 328	WITHIN 100.6174267	11
FRONT # 329	WITHIN 99.8827064	11
FRONT # 330	WITHIN 97.4963307	11
FRONT # 331	WITHIN 96.0003351	11
FRONT # 332	WITHIN 100.436761	11



CLE

CLEVELAND, OHIO

05555

IR 1000  
SIZE OF AREA KNOWN 1000 00

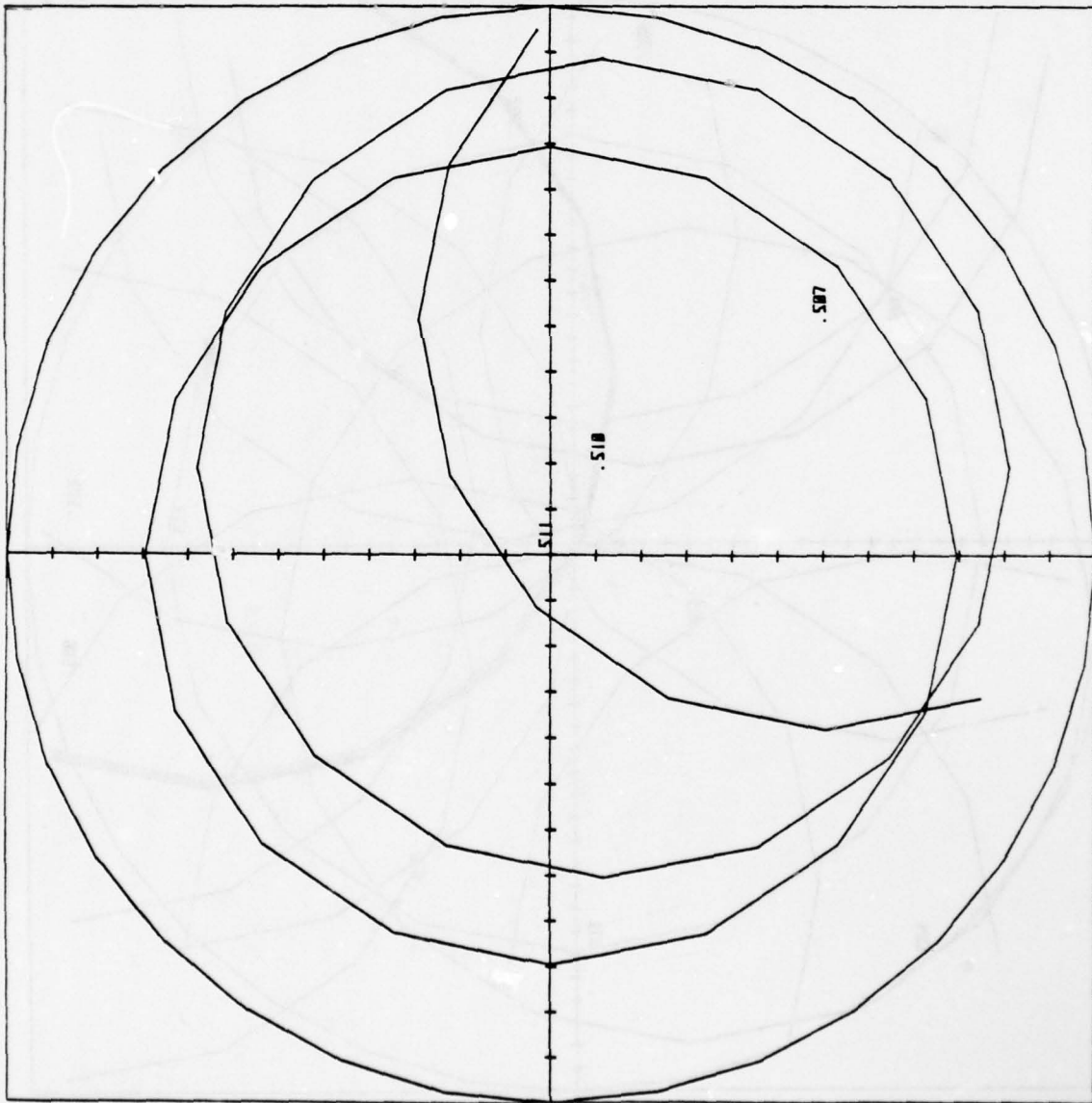
FILE # 511 USED AS NOMINAL SITE

POINT # 507 WITHIN 24.68418496 NM

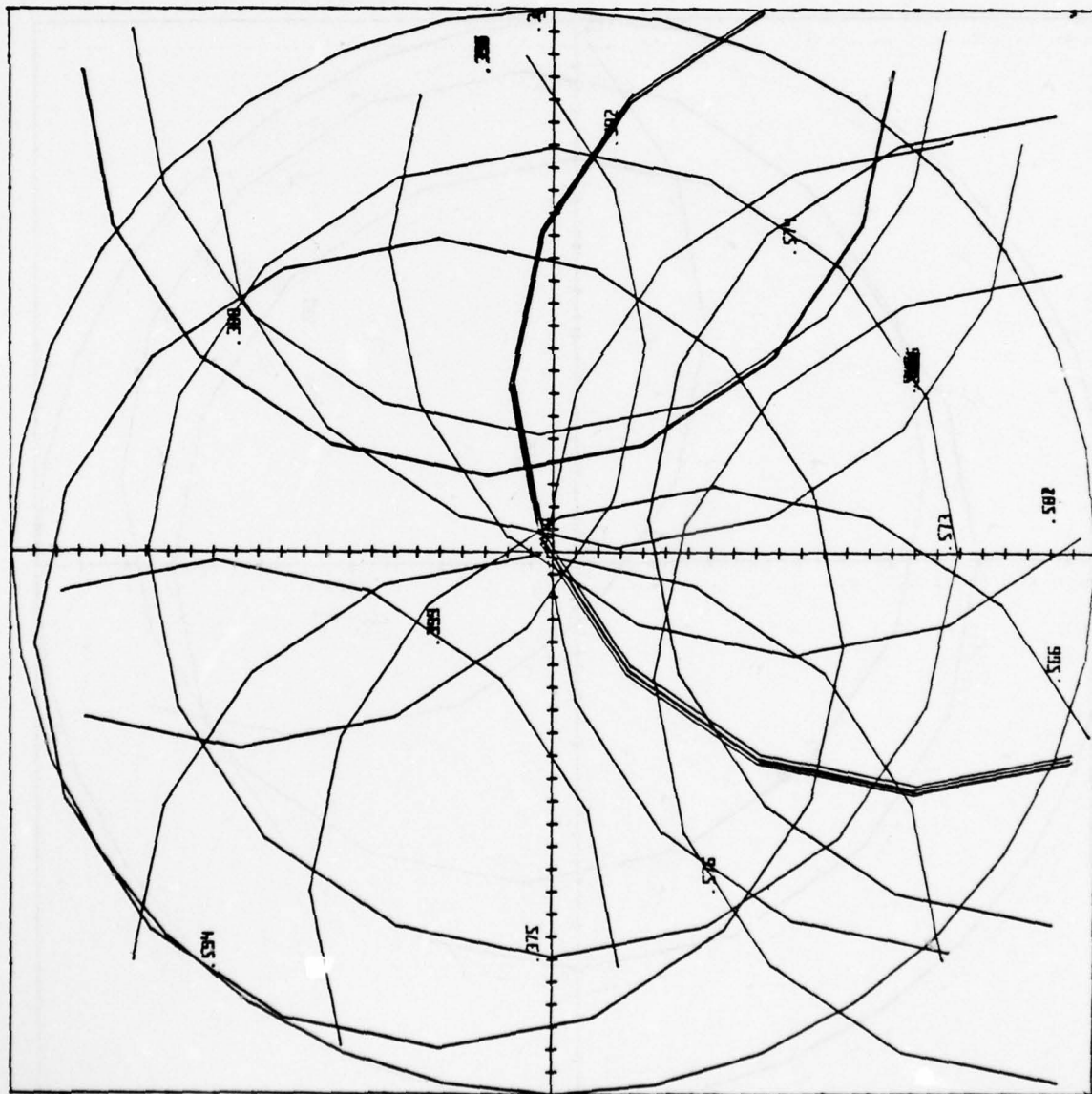
POINT # 510 WITHIN 11.18438033 NM

POINT # 511 WITHIN 0 NM

\*\*\*\* \*\*\*\*\*







D-38

CLT

CHARLOTTE, N. C.

LEGEND: 40000 51000 62000 73000 84000 95000 106000 117000 128000 139000 150000 161000 172000 183000 194000 205000 216000 227000 238000 249000 260000 271000 282000 293000 304000 315000 326000 337000 348000 359000 370000 381000 392000 403000 414000 425000 436000 447000 458000 469000 480000 491000 502000 513000 524000 535000 546000 557000 568000 579000 590000 601000 612000 623000 634000 645000 656000 667000 678000 689000 700000 711000 722000 733000 744000 755000 766000 777000 788000 799000 810000 821000 832000 843000 854000 865000 876000 887000 898000 909000 920000 931000 942000 953000 964000 975000 986000 997000 1008000 1019000 1030000 1041000 1052000 1063000 1074000 1085000 1096000 1107000 1118000 1129000 1140000 1151000 1162000 1173000 1184000 1195000 1206000 1217000 1228000 1239000 1250000 1261000 1272000 1283000 1294000 1305000 1316000 1327000 1338000 1349000 1360000 1371000 1382000 1393000 1404000 1415000 1426000 1437000 1448000 1459000 1470000 1481000 1492000 1503000 1514000 1525000 1536000 1547000 1558000 1569000 1580000 1591000 1602000 1613000 1624000 1635000 1646000 1657000 1668000 1679000 1690000 1701000 1712000 1723000 1734000 1745000 1756000 1767000 1778000 1789000 1800000 1811000 1822000 1833000 1844000 1855000 1866000 1877000 1888000 1899000 1910000 1921000 1932000 1943000 1954000 1965000 1976000 1987000 1998000 2009000 2020000 2031000 2042000 2053000 2064000 2075000 2086000 2097000 2108000 2119000 2130000 2141000 2152000 2163000 2174000 2185000 2196000 2207000 2218000 2229000 2240000 2251000 2262000 2273000 2284000 2295000 2306000 2317000 2328000 2339000 2350000 2361000 2372000 2383000 2394000 2405000 2416000 2427000 2438000 2449000 2460000 2471000 2482000 2493000 2504000 2515000 2526000 2537000 2548000 2559000 2570000 2581000 2592000 2603000 2614000 2625000 2636000 2647000 2658000 2669000 2680000 2691000 2702000 2713000 2724000 2735000 2746000 2757000 2768000 2779000 2790000 2801000 2812000 2823000 2834000 2845000 2856000 2867000 2878000 2889000 2900000 2911000 2922000 2933000 2944000 2955000 2966000 2977000 2988000 2999000 3010000 3021000 3032000 3043000 3054000 3065000 3076000 3087000 3098000 3109000 3120000 3131000 3142000 3153000 3164000 3175000 3186000 3197000 3208000 3219000 3230000 3241000 3252000 3263000 3274000 3285000 3296000 3307000 3318000 3329000 3340000 3351000 3362000 3373000 3384000 3395000 3406000 3417000 3428000 3439000 3450000 3461000 3472000 3483000 3494000 3505000 3516000 3527000 3538000 3549000 3560000 3571000 3582000 3593000 3604000 3615000 3626000 3637000 3648000 3659000 3670000 3681000 3692000 3703000 3714000 3725000 3736000 3747000 3758000 3769000 3780000 3791000 3802000 3813000 3824000 3835000 3846000 3857000 3868000 3879000 3890000 3901000 3912000 3923000 3934000 3945000 3956000 3967000 3978000 3989000 4000000 4011000 4022000 4033000 4044000 4055000 4066000 4077000 4088000 4099000 4110000 4121000 4132000 4143000 4154000 4165000 4176000 4187000 4198000 4209000 4220000 4231000 4242000 4253000 4264000 4275000 4286000 4297000 4308000 4319000 4330000 4341000 4352000 4363000 4374000 4385000 4396000 4407000 4418000 4429000 4440000 4451000 4462000 4473000 4484000 4495000 4506000 4517000 4528000 4539000 4550000 4561000 4572000 4583000 4594000 4605000 4616000 4627000 4638000 4649000 4660000 4671000 4682000 4693000 4704000 4715000 4726000 4737000 4748000 4759000 4770000 4781000 4792000 4803000 4814000 4825000 4836000 4847000 4858000 4869000 4880000 4891000 4902000 4913000 4924000 4935000 4946000 4957000 4968000 4979000 4990000 5001000 5012000 5023000 5034000 5045000 5056000 5067000 5078000 5089000 5100000 5111000 5122000 5133000 5144000 5155000 5166000 5177000 5188000 5199000 5210000 5221000 5232000 5243000 5254000 5265000 5276000 5287000 5298000 5309000 5320000 5331000 5342000 5353000 5364000 5375000 5386000 5397000 5408000 5419000 5430000 5441000 5452000 5463000 5474000 5485000 5496000 5507000 5518000 5529000 5540000 5551000 5562000 5573000 5584000 5595000 5606000 5617000 5628000 5639000 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7025000 7036000 7047000 7058000 7069000 7080000 7091000 7102000 7113000 7124000 7135000 7146000 7157000 7168000 7179000 7190000 7201000 7212000 7223000 7234000 7245000 7256000 7267000 7278000 7289000 7300000 7311000 7322000 7333000 7344000 7355000 7366000 7377000 7388000 7399000 7410000 7421000 7432000 7443000 7454000 7465000 7476000 7487000 7498000 7509000 7520000 7531000 7542000 7553000 7564000 7575000 7586000 7597000 7608000 7619000 7630000 7641000 7652000 7663000 7674000 7685000 7696000 7707000 7718000 7729000 7740000 7751000 7762000 7773000 7784000 7795000 7806000 7817000 7828000 7839000 7850000 7861000 7872000 7883000 7894000 7905000 7916000 7927000 7938000 7949000 7960000 7971000 7982000 7993000 8004000 8015000 8026000 8037000 8048000 8059000 8070000 8081000 8092000 8103000 8114000 8125000 8136000 8147000 8158000 8169000 8180000 8191000 8202000 8213000 8224000 8235000 8246000 8257000 8268000 8279000 8290000 8301000 8312000 8323000 8334000 8345000 8356000 8367000 8378000 8389000 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12239000 12250000



CLT

CHARLOTTE, N. C.

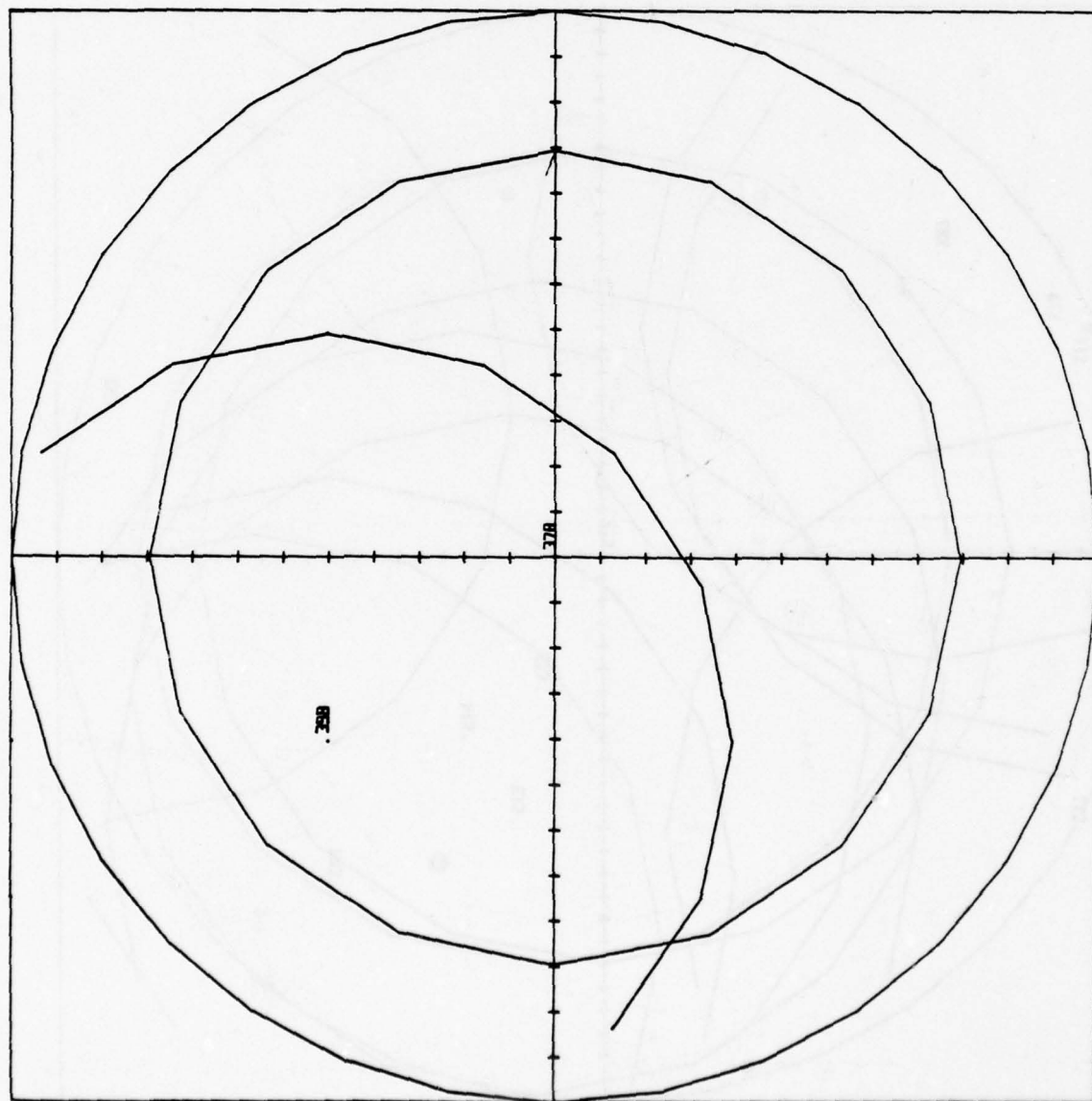
FILE # 378 USED AS NORMAL SITE

PHOTO # 378 WITHIN 0 NM

PHOTO # 393 WITHIN 32.21638569 NM

PHOTO # 394 WITHIN 32.21638569 NM

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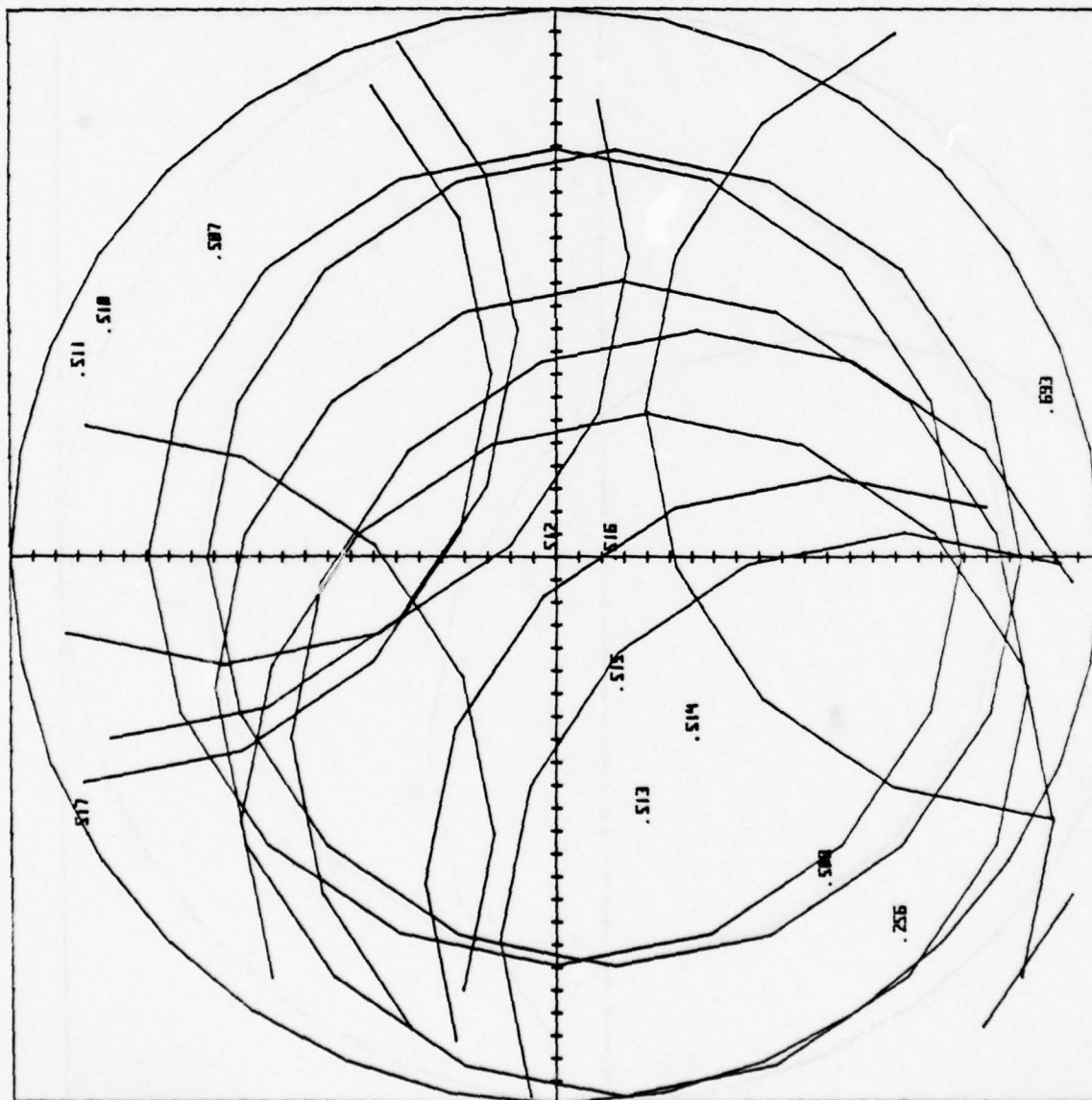
CMH

OLYMPIUS, OHIO

PLANT 4000 GIVES PHOTOS 89.44271  
 FILE OF AREA (PHOTOS (H) 120

FILE # 512 USED AS NOMINAL SITE

PHOTO # 256 WITHIN 114.0944666  
 PHOTO # 507 WITHIN 96.45186413  
 PHOTO # 508 WITHIN 93.95796289  
 PHOTO # 509 WITHIN 109.6458407  
 PHOTO # 511 WITHIN 111.0300338  
 PHOTO # 512 WITHIN 0 NM  
 PHOTO # 513 WITHIN 61.45065464  
 PHOTO # 514 WITHIN 50.6441745  
 PHOTO # 515 WITHIN 32.44551634  
 PHOTO # 516 WITHIN 13.10789607  
 PHOTO # 517 WITHIN 119.5384207  
 PHOTO # 593 WITHIN 113.7340415





CMH

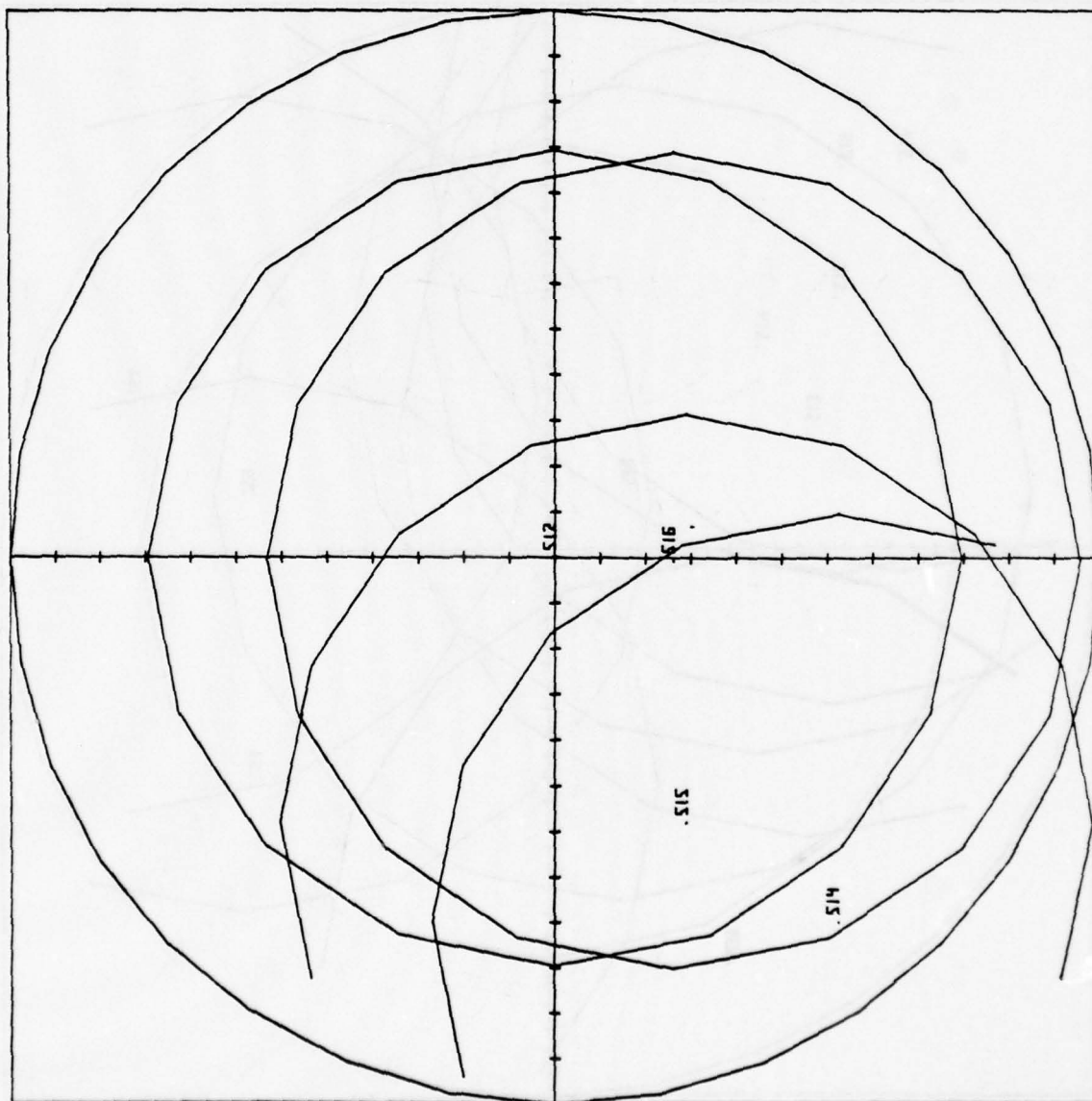
COLUMBUS, OHIO

35953

WORLD  
SITE OF OPEN PLOTS (MM) 60

FILE # 517 USED AS INTERNAL SITE

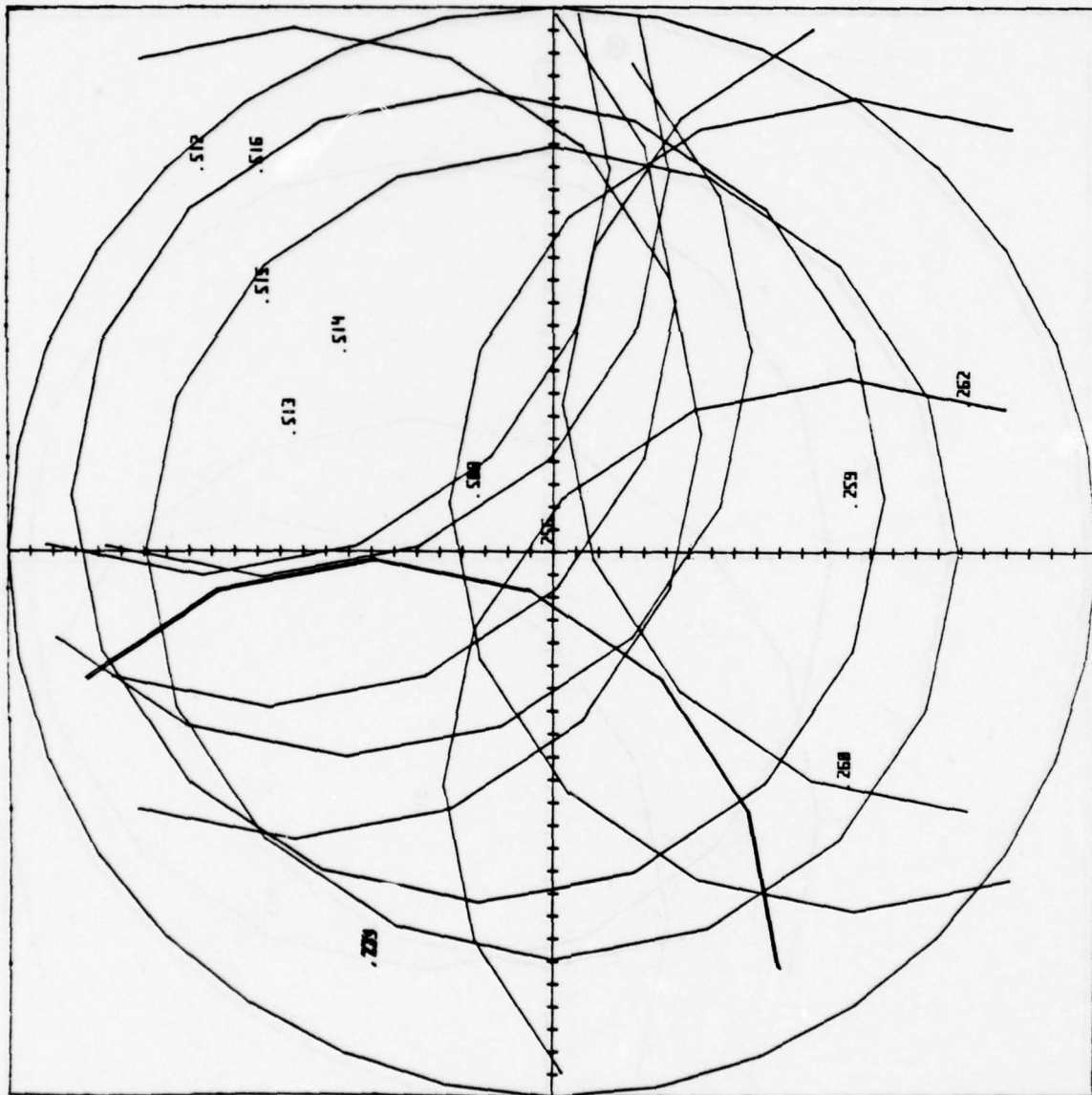
PROOF # 512 WITHIN 0 MM  
PROOF # 514 WITHIN 50.6445745 MM  
PROOF # 515 WITHIN 35.4451634 MM  
PROOF # 516 WITHIN 13.10788607 MM  
\*\*\*\*\*





CV 6

CINCINNATI, OHIO  
(COVINGTON)



WIGHT 4000 CLEVELANDS 89.442191  
 TLE OF AREA RADIOS (100) 100  
 FILE # 250 USED AS NORMAL SITE  
 POINT # 233 WITHIN 37.3062412 IN  
 POINT # 234 WITHIN 34.21228372 IN  
 POINT # 250 WITHIN 0 IN  
 POINT # 259 WITHIN 67.575117 IN  
 POINT # 260 WITHIN 82.00260694 IN  
 POINT # 261 WITHIN 57.00712414 IN  
 POINT # 508 WITHIN 30.54500087 IN  
 POINT # 509 WITHIN 20.54500087 IN  
 POINT # 510 WITHIN 119.0043000 IN  
 POINT # 513 WITHIN 62.51270400 IN  
 POINT # 514 WITHIN 67.71260037 IN  
 POINT # 515 WITHIN 115.20847524 IN  
 POINT # 516 WITHIN 105.4421128 IN

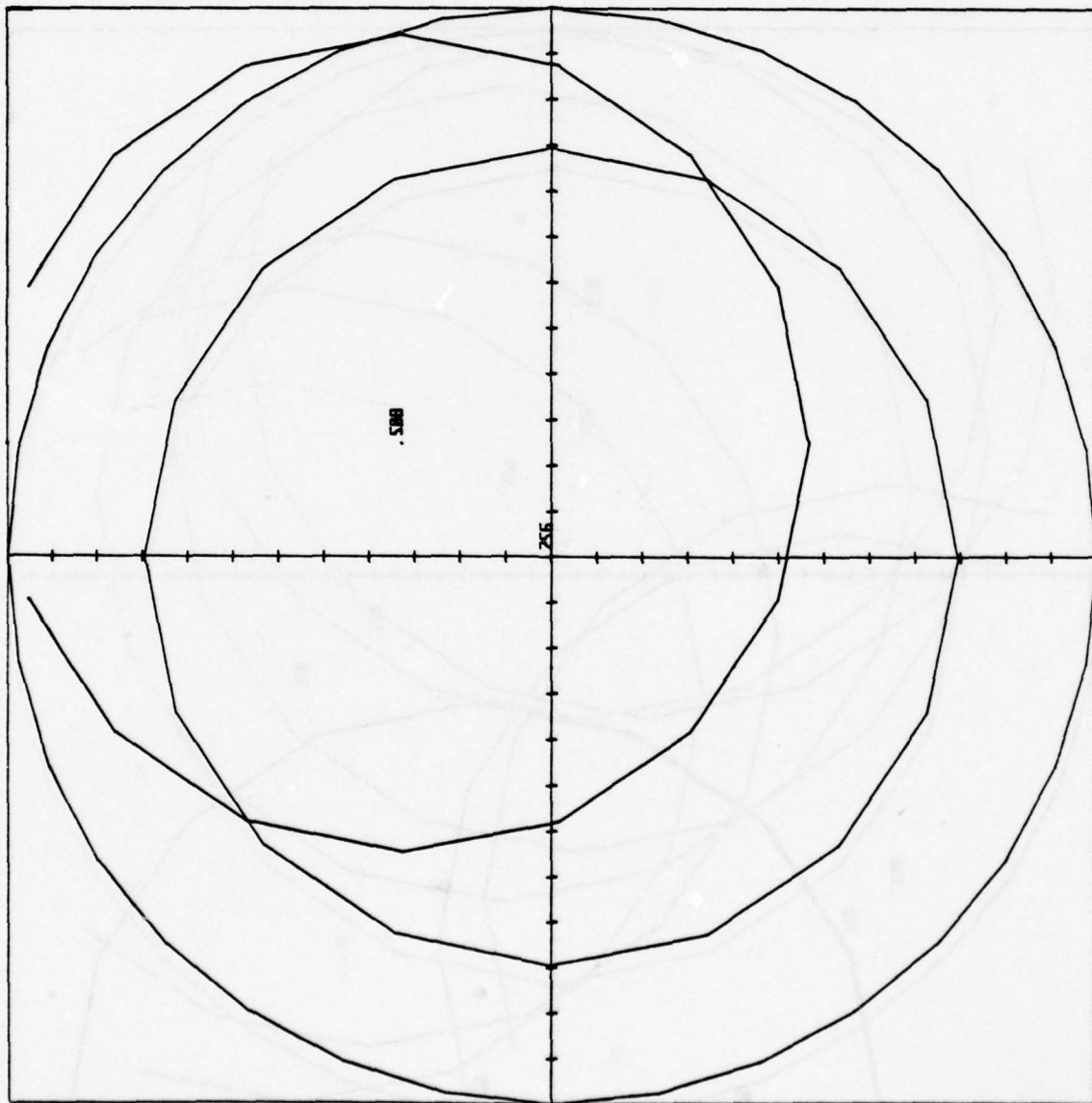


CV 6

CINCINNATI, OHIO  
(COVINGTON)

FILE # 256 USED AS HORIZONTAL SITE

FILE # 256 USED AS HORIZONTAL SITE  
 FILE # 256 WITHIN 0.000  
 FILE # 256 WITHIN 0.000  
 FILE # 256 WITHIN 0.000  
 FILE # 256 WITHIN 0.000

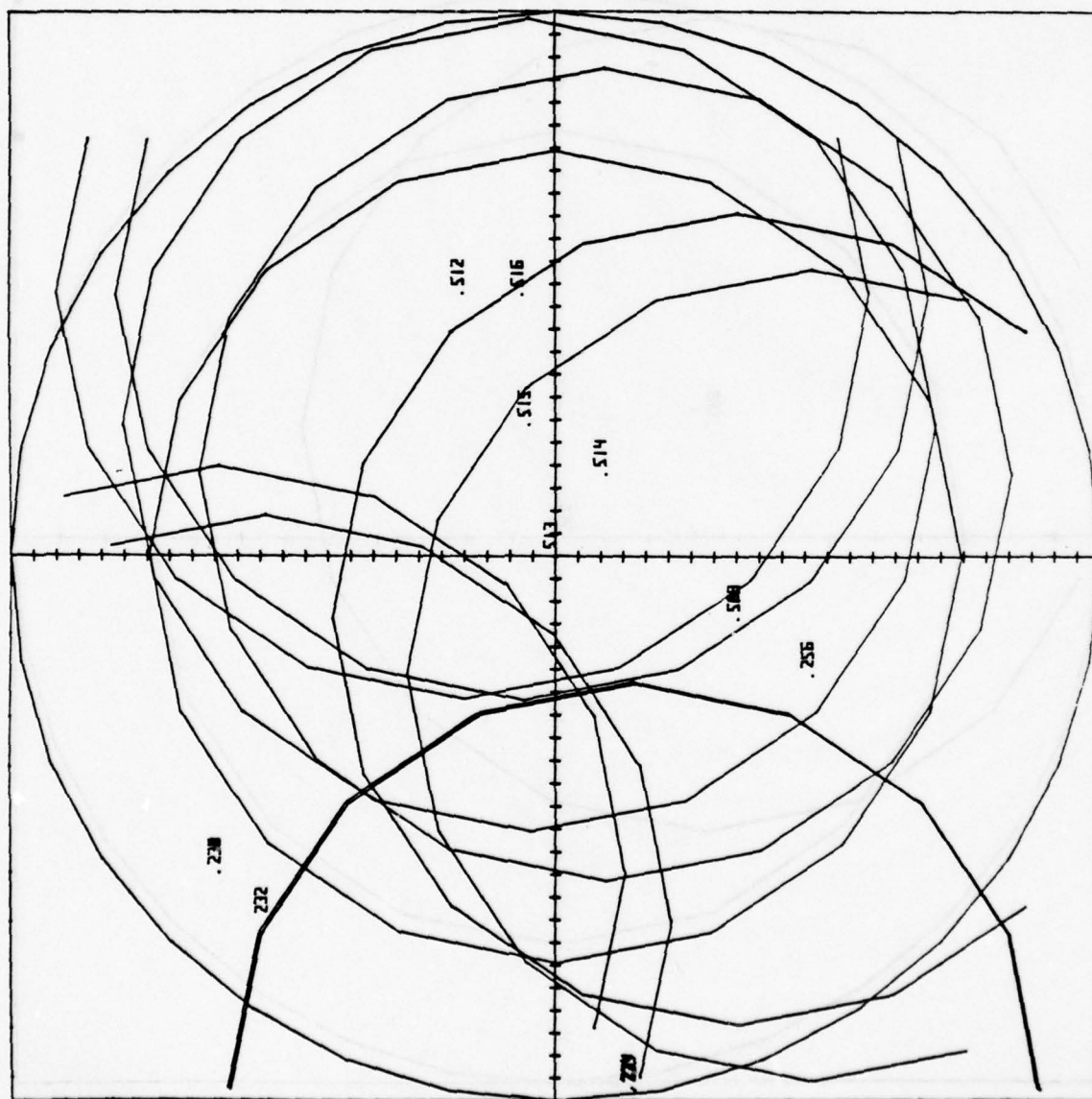




DAYTON, OHIO

1971  
1972

ALL INFORMATION CONTAINED  
HEREIN IS UNCLASSIFIED

[illegible]



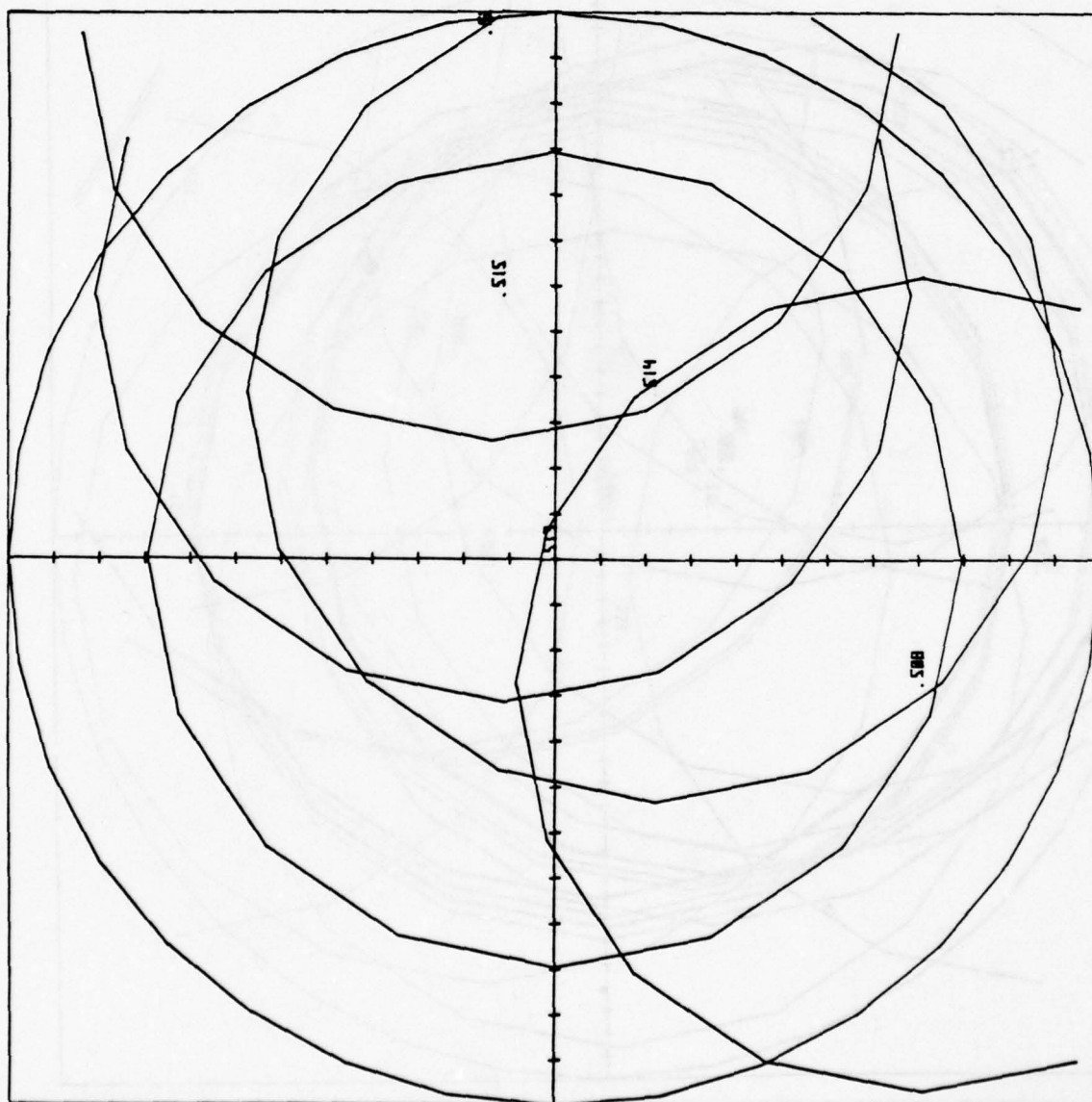
DAY

DAYTON, OHIO

HEIGHT 1000 GIVE RADIUS 44.7213596  
SCALE OF AREA (RADIUS 100) 60

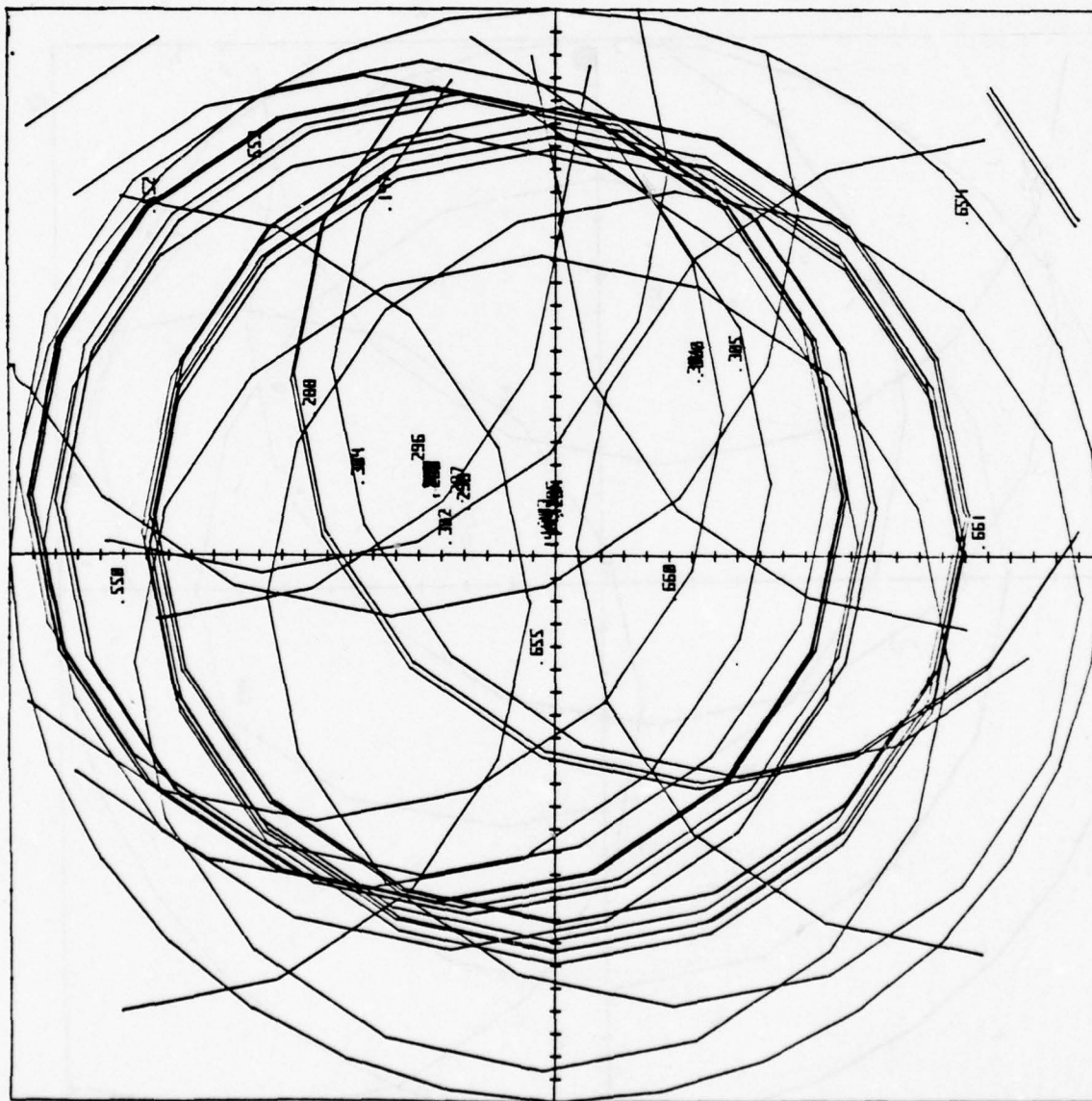
FILE # 513 USED AS MONITOR SITE

PHASE # 508	WITHIN 42.71618392	N
PHASE # 509	WITHIN 42.71618392	P
PHASE # 513	WITHIN 0	HH
PHASE # 514	WITHIN 21.24841784	P
PHASE # 515	WITHIN 29.57283453	P
PHASE # 516	WITHIN 60	HH





DCA  
WASHINGTON NATL.



PL 1047-4000 GIVES PHOTOS 89-44271910  
PL OF AREA PHOTOS 100-120

FILE # 146 USED AS NORMAL SITE

PHOTO # 144	WITHIN 2.67036083	N
PHOTO # 145	WITHIN 2.761731026	N
PHOTO # 146	WITHIN 0	N
PHOTO # 147	WITHIN 34.1947467	N
PHOTO # 148	WITHIN 61.1540203	N
PHOTO # 149	WITHIN 29.324124	N
PHOTO # 150	WITHIN 38.7614241	N
PHOTO # 151	WITHIN 24.884124	N
PHOTO # 152	WITHIN 29.0055807	N
PHOTO # 153	WITHIN 29.384124	N
PHOTO # 154	WITHIN 27.20966128	N
PHOTO # 155	WITHIN 8.943677956	N
PHOTO # 156	WITHIN 34.70652	N
PHOTO # 157	WITHIN 33.64301358	N
PHOTO # 158	WITHIN 21.6435641	N
PHOTO # 159	WITHIN 21.6435641	N
PHOTO # 160	WITHIN 51.1162934	N
PHOTO # 161	WITHIN 48.74807157	N
PHOTO # 162	WITHIN 23.2231742	N
PHOTO # 163	WITHIN 5.225422132	N
PHOTO # 164	WITHIN 45.0933279	N
PHOTO # 165	WITHIN 57.77401913	N
PHOTO # 166	WITHIN 92.0021061	N
PHOTO # 167	WITHIN 115.6998113	N
PHOTO # 168	WITHIN 107.3590903	N
PHOTO # 169	WITHIN 116.13523	N
PHOTO # 170	WITHIN 33.70445075	N
PHOTO # 171	WITHIN 27.74010104	N
PHOTO # 172	WITHIN 44.00920134	N



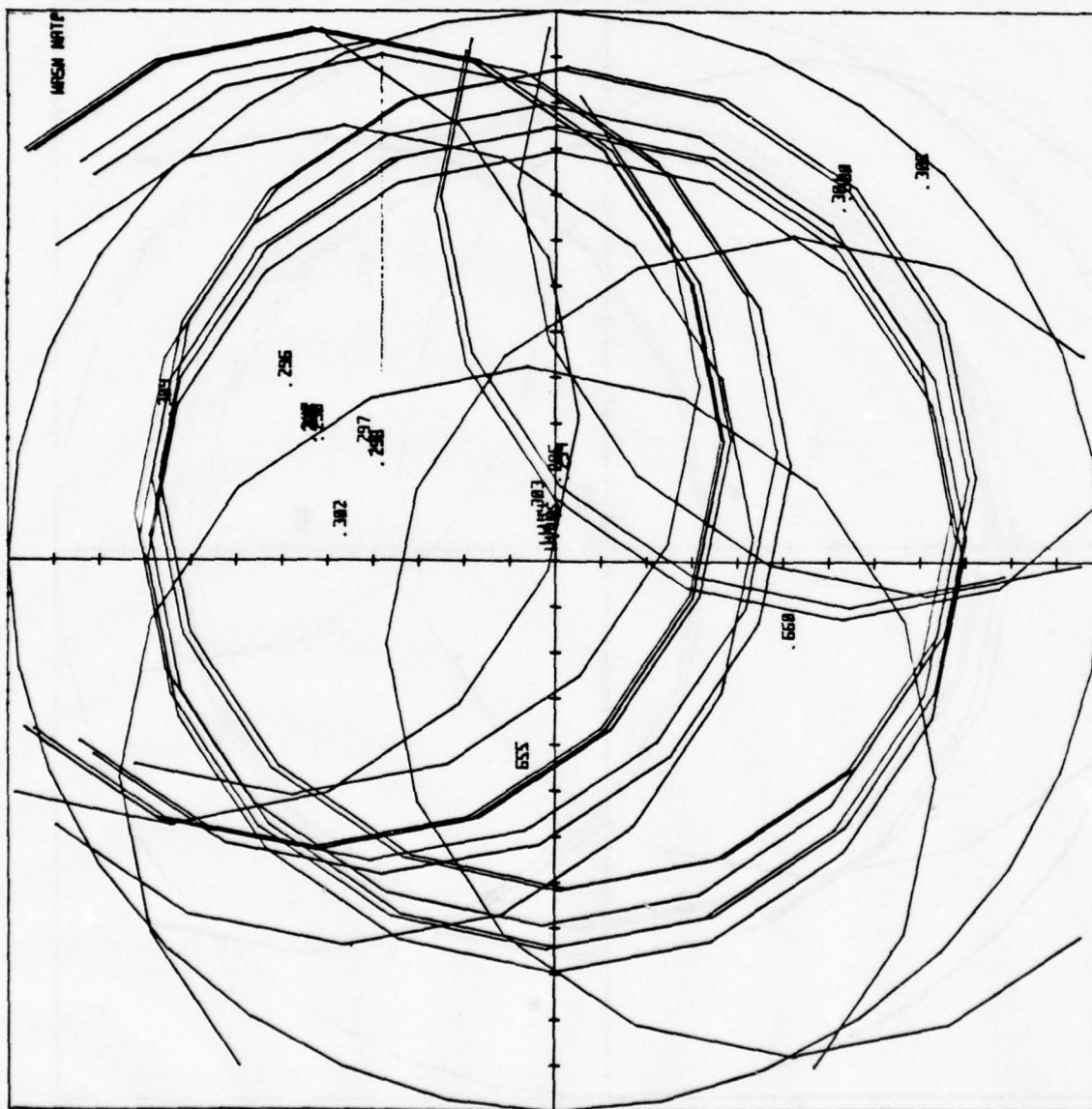
WASHINGTON NATL.

1001 11401-341

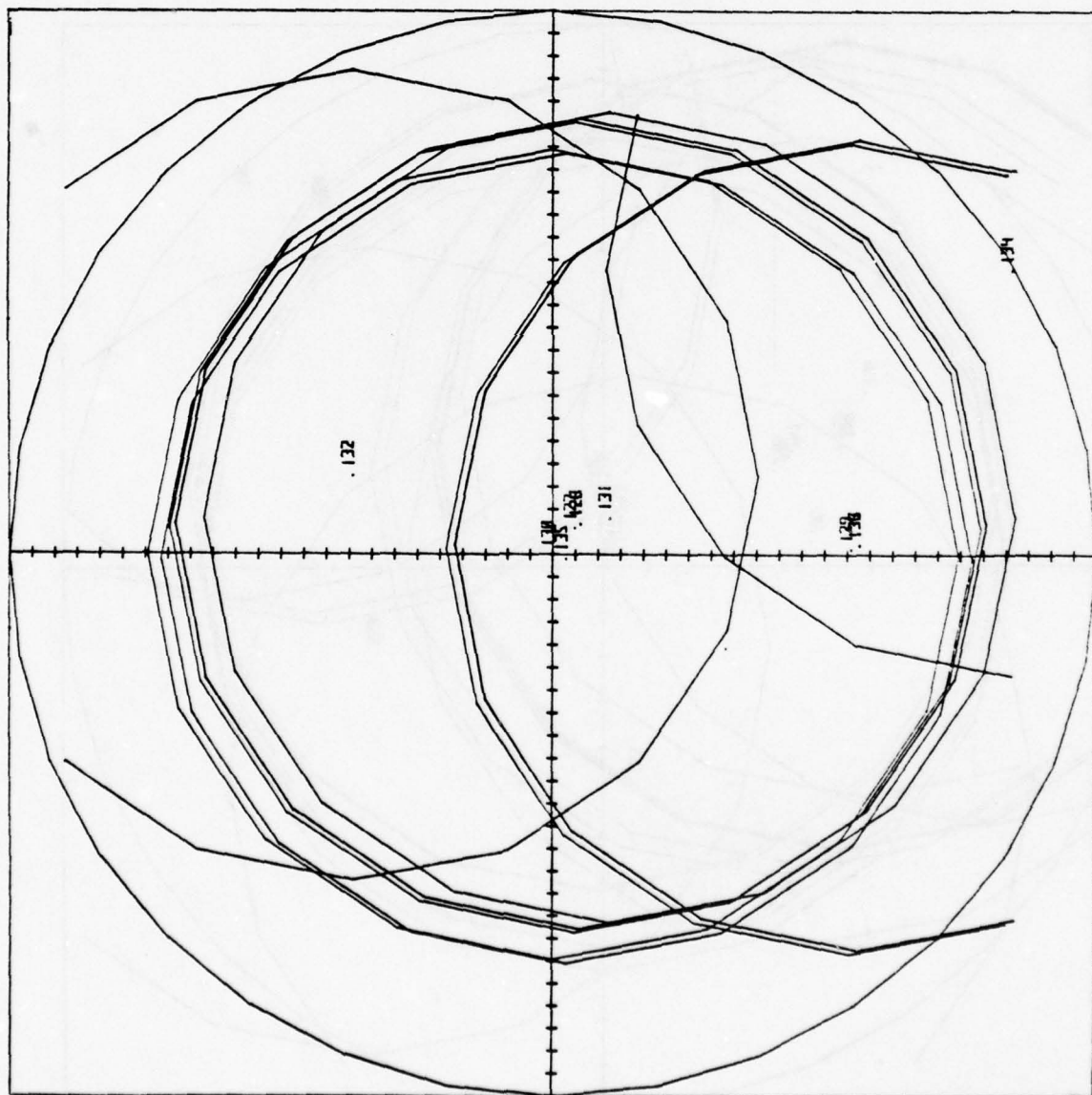
TABLE 1. *Continued*

FILE # 146 USED AS NOMINAL SITE

	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653
--	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----







DEN

DENVER, COLORADO

1000 4000 GIVES PHOTOS 89.442719  
21 OF 100 PHOTOS 100.120

LE # 130 USED NO MONITOR SITE

PHOTO # 126	WITHIN 8.12357892	H
PHOTO # 127	WITHIN 8.12357892	H
PHOTO # 128	WITHIN 8.12357892	H
PHOTO # 129	WITHIN 8.12357892	H
PHOTO # 130	WITHIN 8.12357892	H
PHOTO # 131	WITHIN 14.9402848	H
PHOTO # 132	WITHIN 47.5134500	H
PHOTO # 133	WITHIN 119.13448	H
PHOTO # 134	WITHIN 340.824200	H
PHOTO # 135	WITHIN 67.72106378	H
PHOTO # 136	WITHIN 67.72106378	H
PHOTO # 137	WITHIN 67.72106378	H

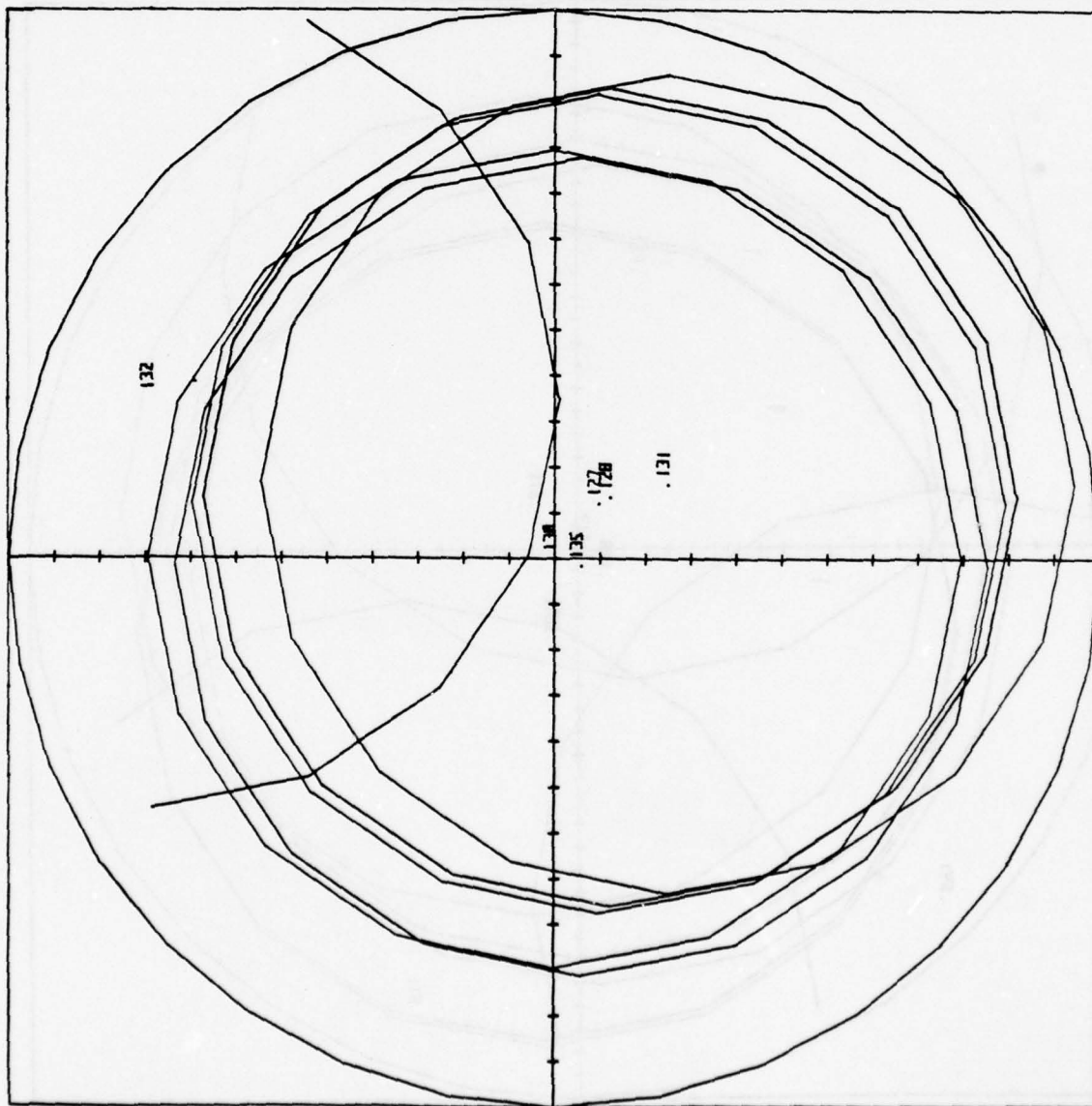


DEN

DENVER, COLORADO

RECORD OF AREA PHOTOS - PHOTO 2135955  
 FILE # 130 USED AS NOMINAL SITE

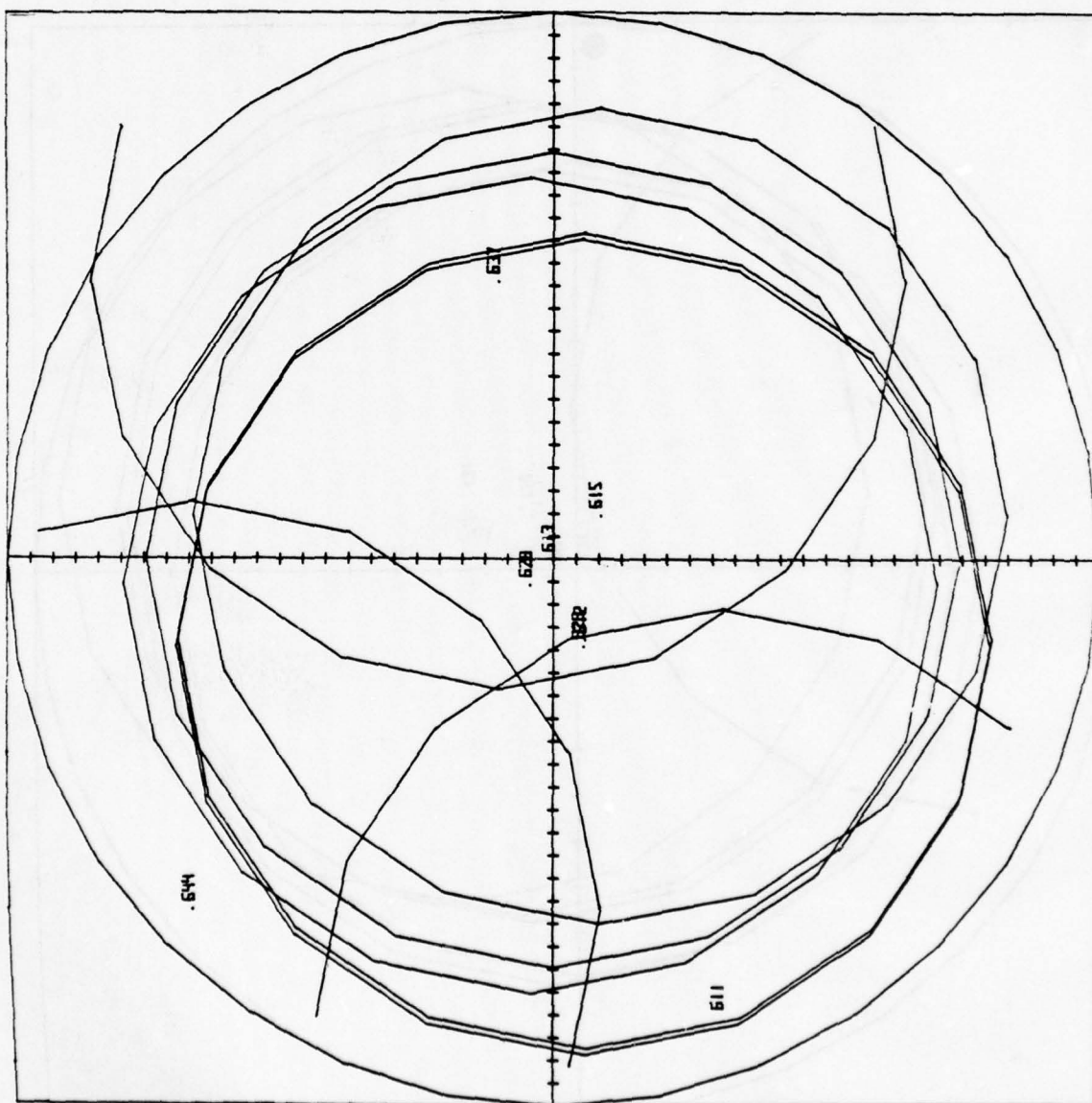
PHOTO # 126	WIDTH 9.1225092	MM
PHOTO # 127	WIDTH 7.74564057	MM
PHOTO # 128	WIDTH 9.1225092	MM
PHOTO # 129	WIDTH 9.1225092	MM
PHOTO # 130	WIDTH 14.9405648	MM
PHOTO # 131	WIDTH 47.5134500	MM
PHOTO # 132	WIDTH 21.07924300	MM





DFW

DALLAS/FT. WORTH REGIONAL



1. LIGHT 4000 GIVES PHOTOS 89.442719  
 1.2 OF AREA (RADIUS 100) 120

FILE # 613 USED AS NOMINAL SIZE

PHOTO # 611	WITHIN 107.0766784	N
PHOTO # 612	WITHIN 19.1481333	N
PHOTO # 613	WITHIN 0	N
PHOTO # 614	WITHIN 14.1103202	N
PHOTO # 615	WITHIN 7.44164608	N
PHOTO # 616	WITHIN 20.2498044	N
PHOTO # 617	WITHIN 62.1145255	N
PHOTO # 618	WITHIN 110.2040724	N
PHOTO # 619	WITHIN 110.2040724	N

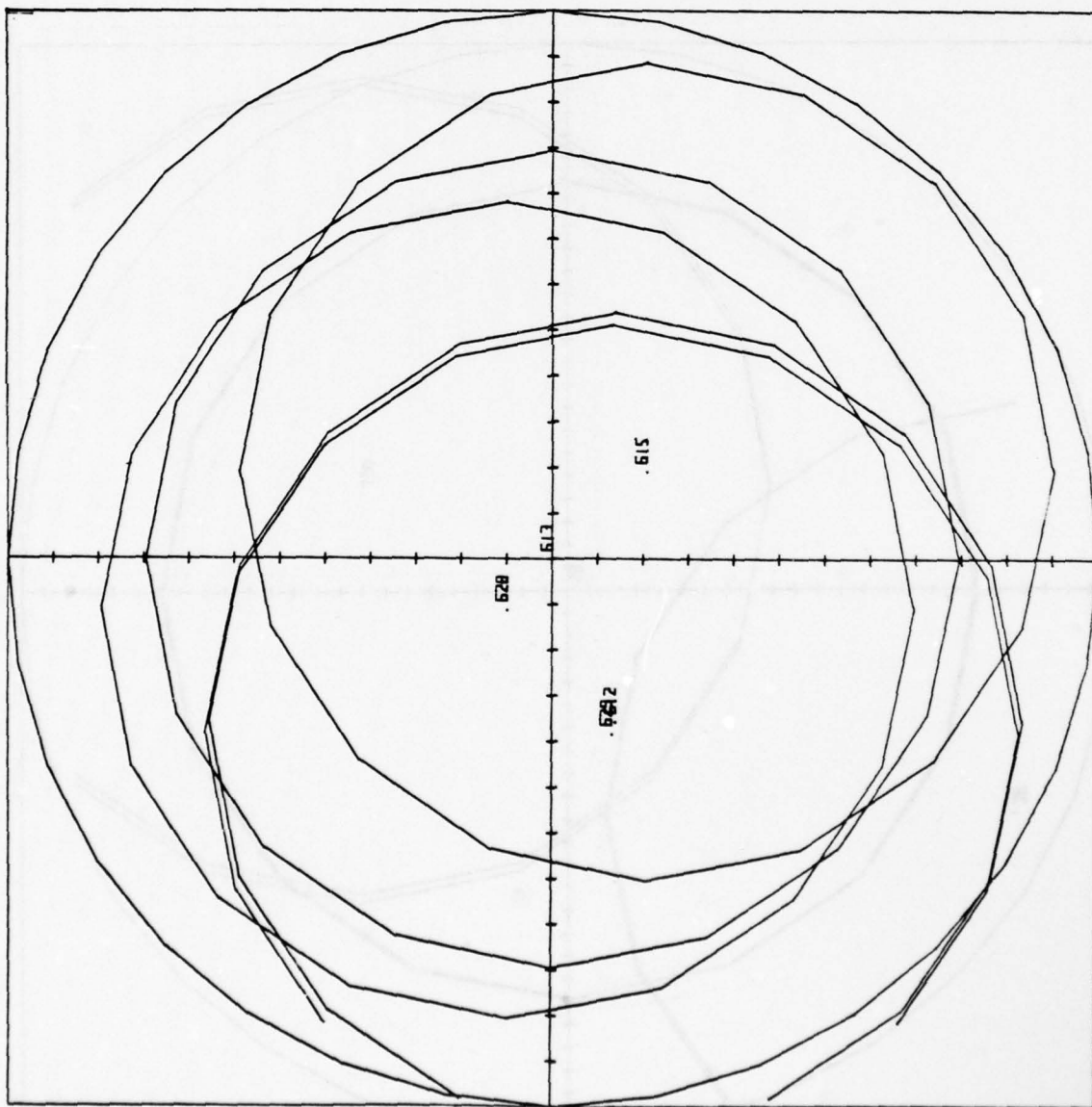


DFW

DALLAS/FT. WORTH REGIONAL

DATE OF ORDER: 10/1/55  
FILE # 613 USED AS NOMINAL SITE

PHASE # 612 WITHIN 19.14613338 NM  
PHASE # 613 WITHIN 0 NM  
PHASE # 615 WITHIN 14.1103202 NM  
PHASE # 628 WITHIN 7.4416908 NM  
PHASE # 629 WITHIN 20.24950244 NM





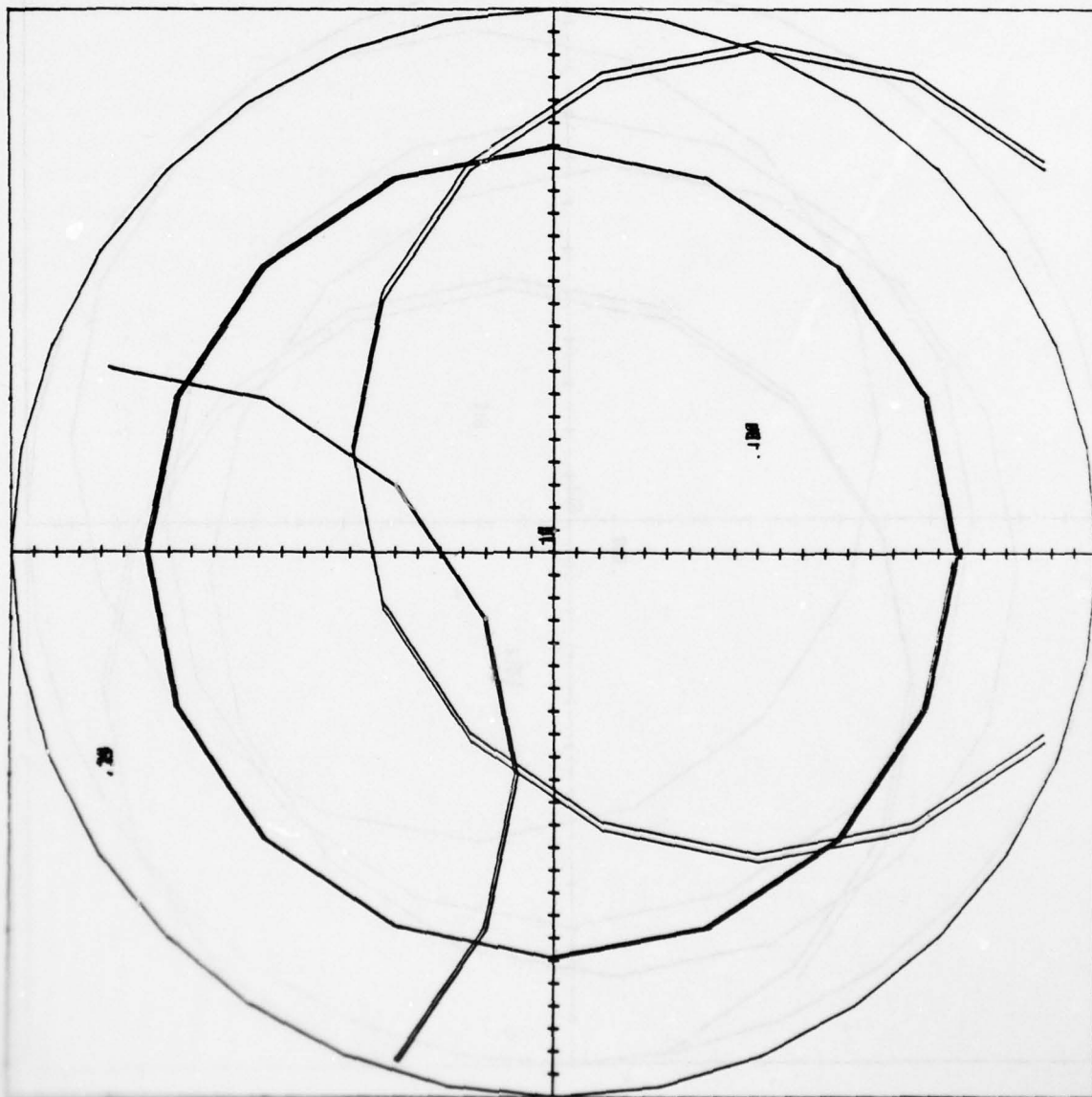
DMA

TUSCON, ARIZONA  
DAVIS MONTANA

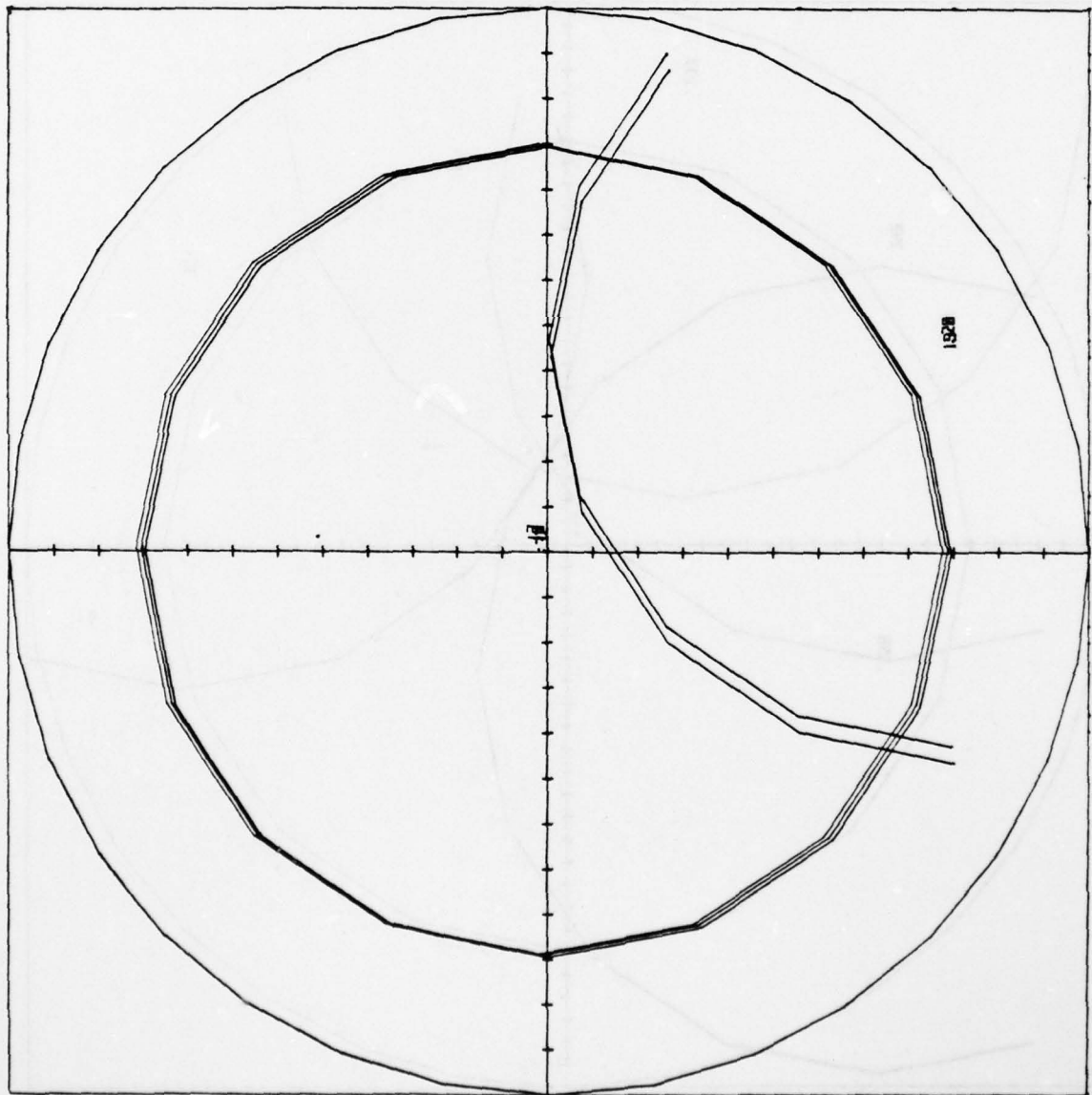
POINT 4000 CIRCLES RADIUS 87.442719  
ICE OF RFLH (RADIUS 100) 120

FILE # 32 USED AS INTERNAL SITE

POINT # 17	WITHIN 1.94469187	H
POINT # 18	WITHIN 0.428732186	H
POINT # 19	WITHIN 50.00132524	H
POINT # 20	WITHIN 50.0067551	H
POINT # 28	WITHIN 109.52112	H
POINT # 30	WITHIN 109.0525197	H
POINT # 31	WITHIN 109.0525197	H
POINT # 32	WITHIN 0	H







DMA

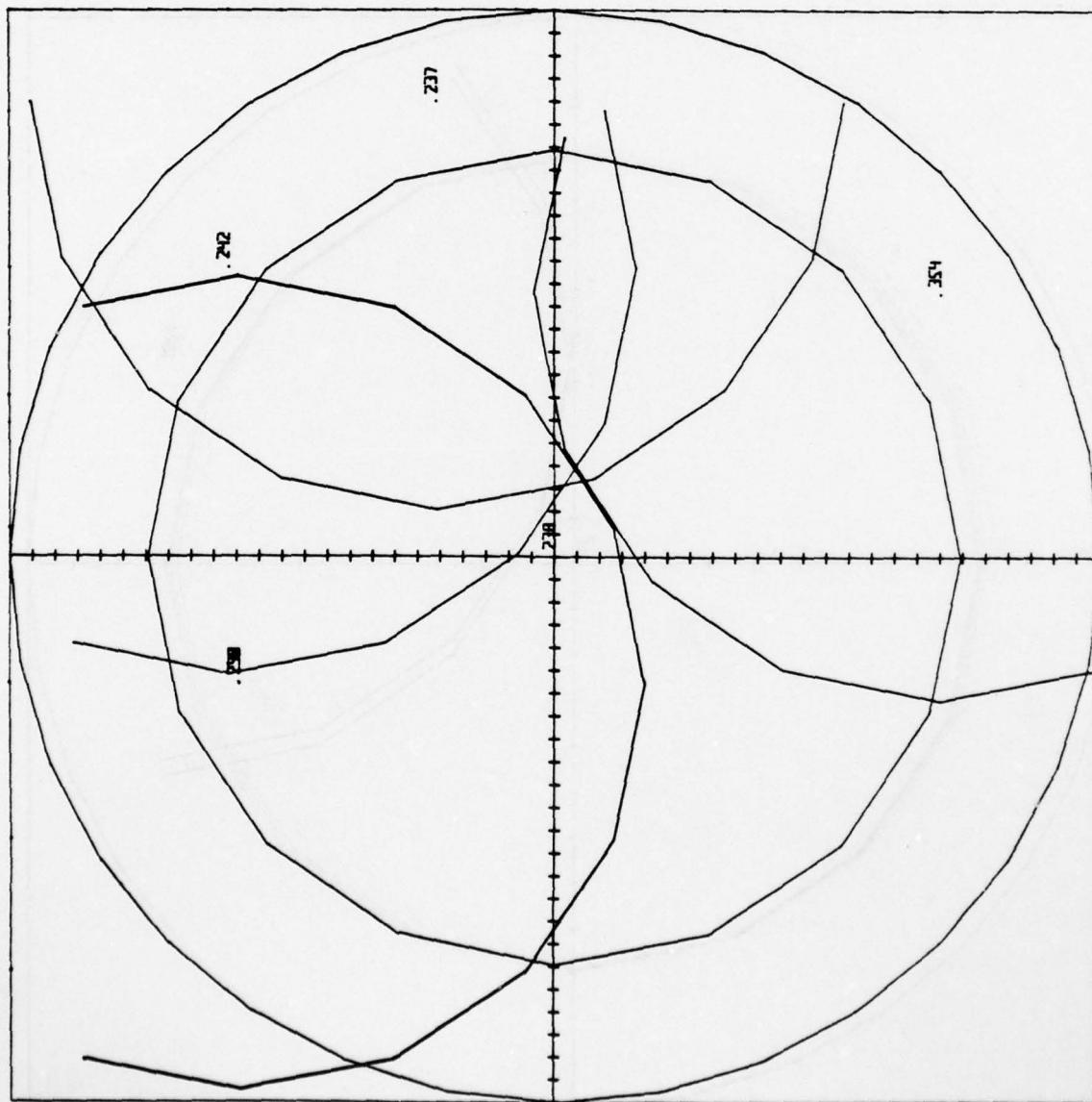
TUSCON, ARIZONA  
DAVIS MONTAN

RIGHT 1000 GIVE RADIUS 44.7213  
L.E. OF RECH RADIUS 44.7213

ILE # 32 USED NO MONTAN SITE

Point # 17 WITHIN 1.0466-187  
Point # 18 WITHIN 0.4727-198  
Point # 19 WITHIN 0.0001-524  
Point # 20 WITHIN 0.0001-551  
Point # 32 WITHIN 0.0001-551  
\*\*\*\* \*\*





DSM

DES MOINES, IOWA

1. DASH 4000 GIVES RADIUS 89.44271  
2. LE OF HKEH RADIUS 100.00000

3. LE # 238 USED AS HORIZONTAL SITE

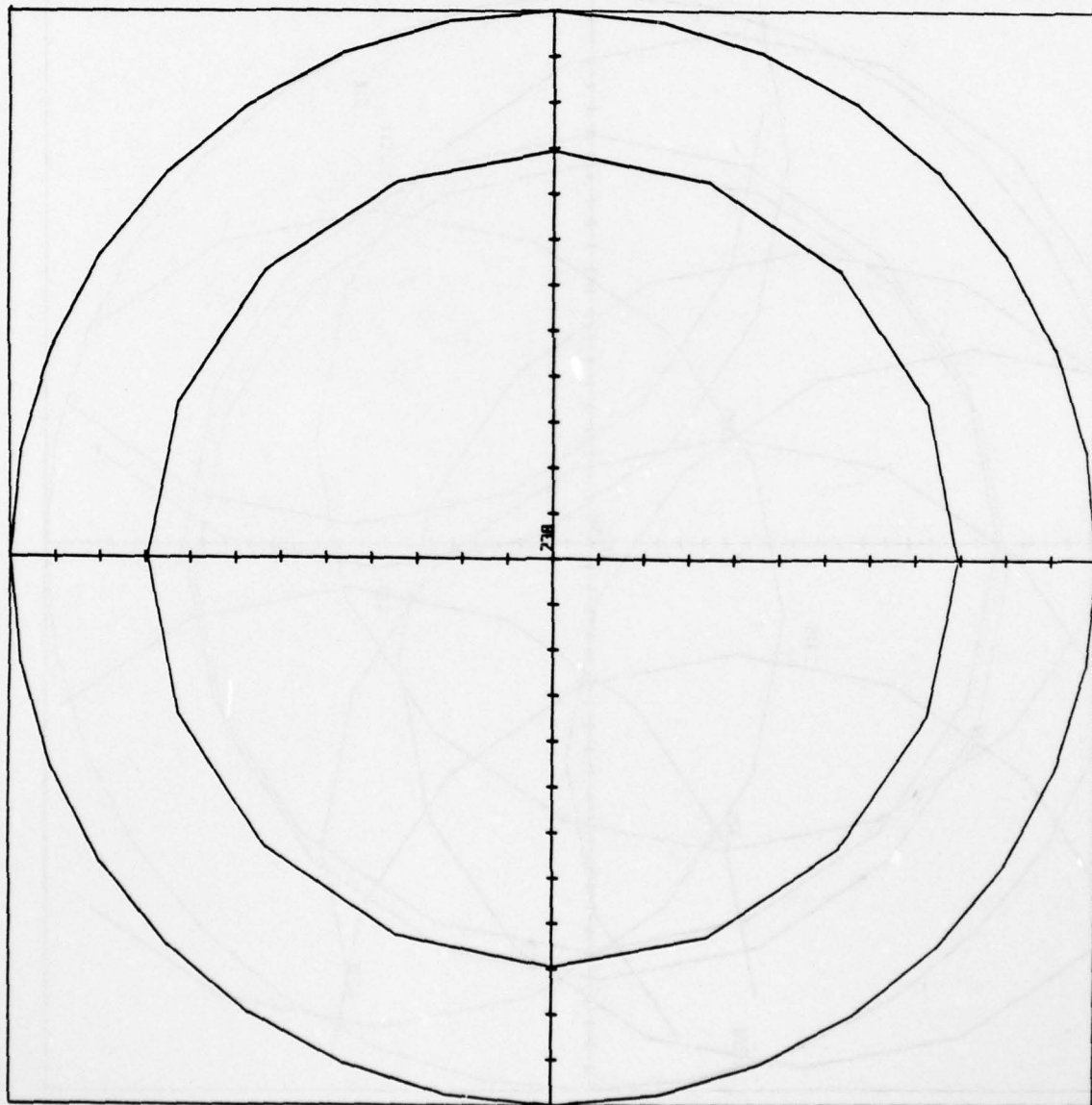
radius # 237 WITHIN 103.1643970  
radius # 238 WITHIN 0.0000000  
radius # 239 WITHIN 74.8970000  
radius # 240 WITHIN 74.8970000  
radius # 242 WITHIN 95.7250000  
radius # 254 WITHIN 102.7547000  
\*\*\* \*\*\*\*\*



DSM

DES MOINES, IOWA

GRI 1000 GIVES RADIUS 44.721358  
FE OF RPLR RADIUS 44.721358  
LE # 208 USED AS HORIZONTAL SITE  
RADIUS # 208 WITHIN 0.001  
LE \*\*\*\*\*

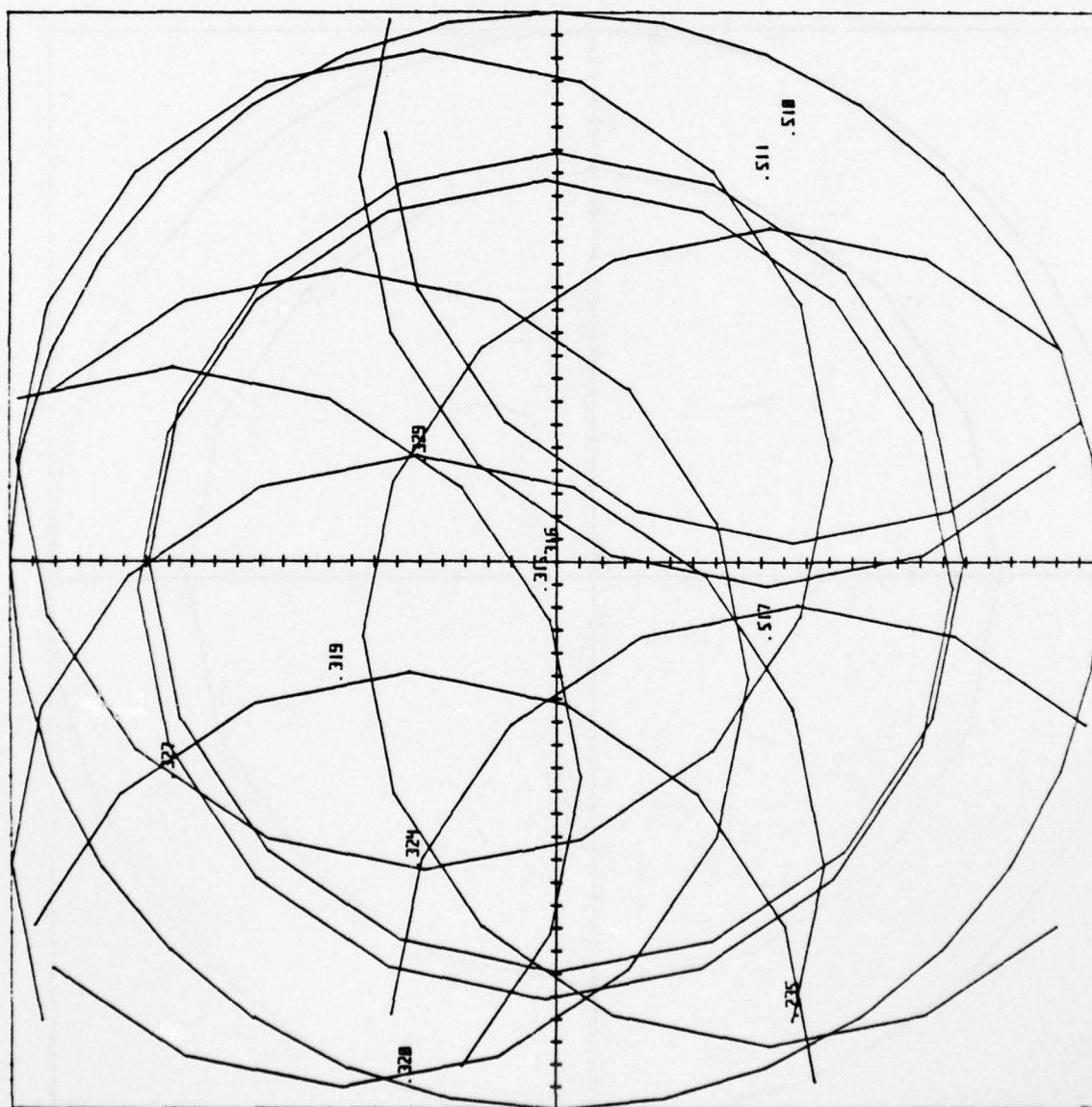




DETROIT-WAYNE

315 TOWNSHIP OF NORTHAMPTON

NAME	NO.	NAME	NO.
Winnick	335	Winnick	335
Winnick	315	Winnick	335
Winnick	316	Winnick	335
Winnick	319	Winnick	335
Winnick	320	Winnick	335
Winnick	324	Winnick	335
Winnick	327	Winnick	335
Winnick	329	Winnick	335
Winnick	310	Winnick	335
Winnick	311	Winnick	335
Winnick	317	Winnick	335

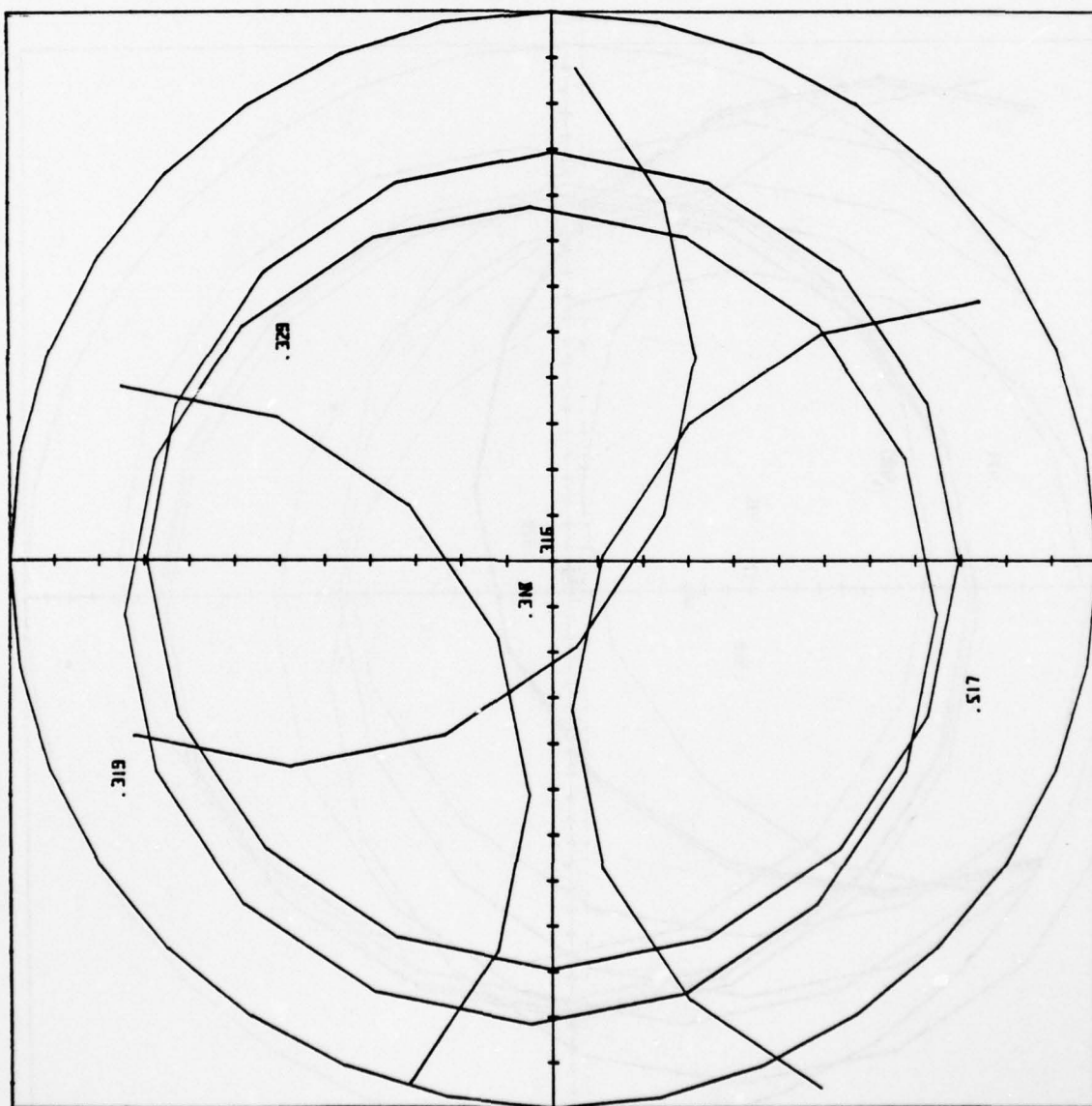




DTM

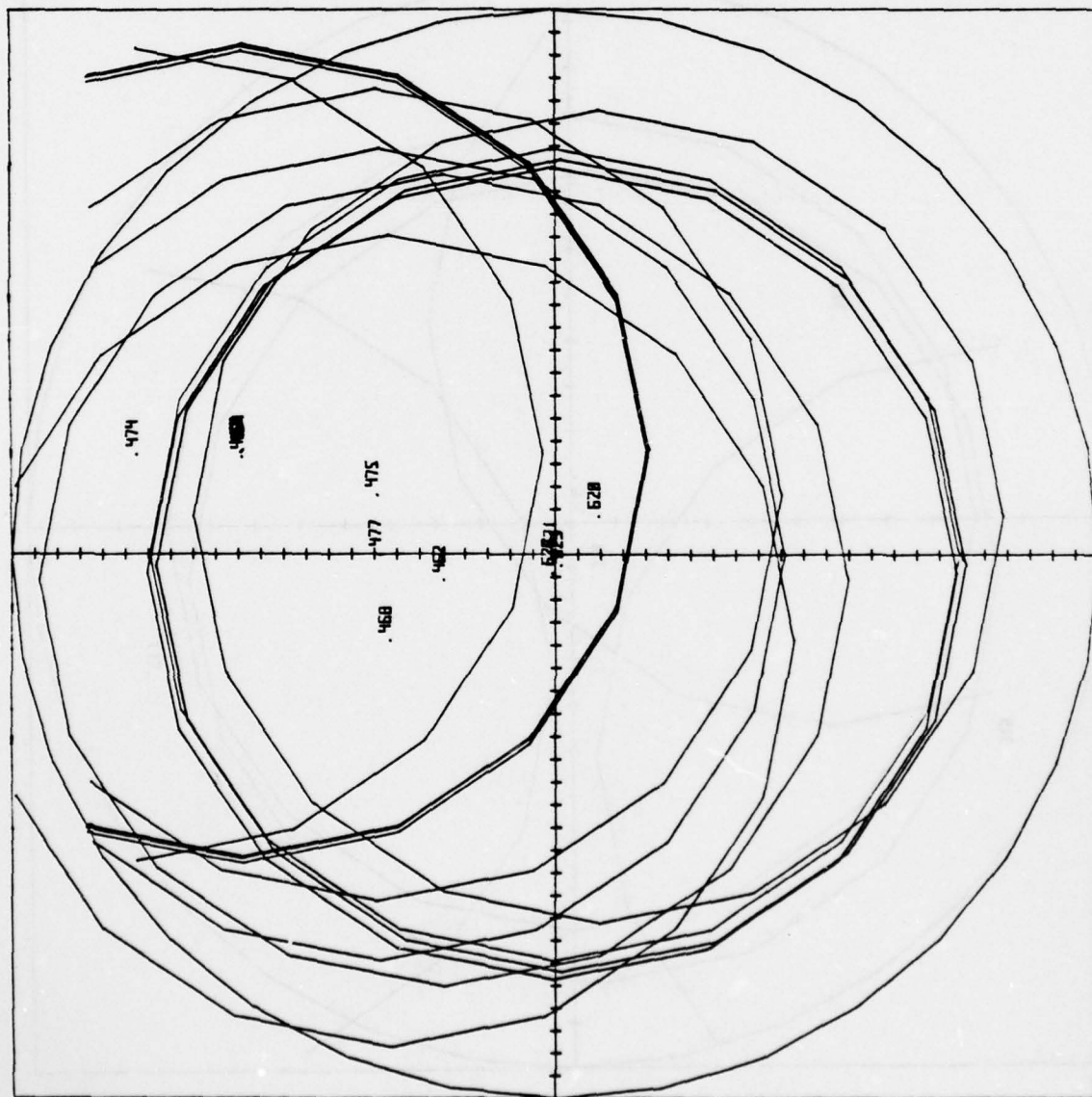
DETROIT-WAYNE

IN 0000  
 SITE OF MEER PHOTO: 0000 00  
 '2135955  
 FILE # 316 USED IN INITIAL SITE  
 PHOTO # 315 WITHIN 6.471609125 NM  
 PHOTO # 316 WITHIN 0 NM  
 PHOTO # 319 WITHIN 53.8136519 NM  
 PHOTO # 324 WITHIN 36.5304791 NM  
 PHOTO # 517 WITHIN 49.6779914 NM  
 \*\*\*\*\*





EL PASO, TEXAS  
ELP

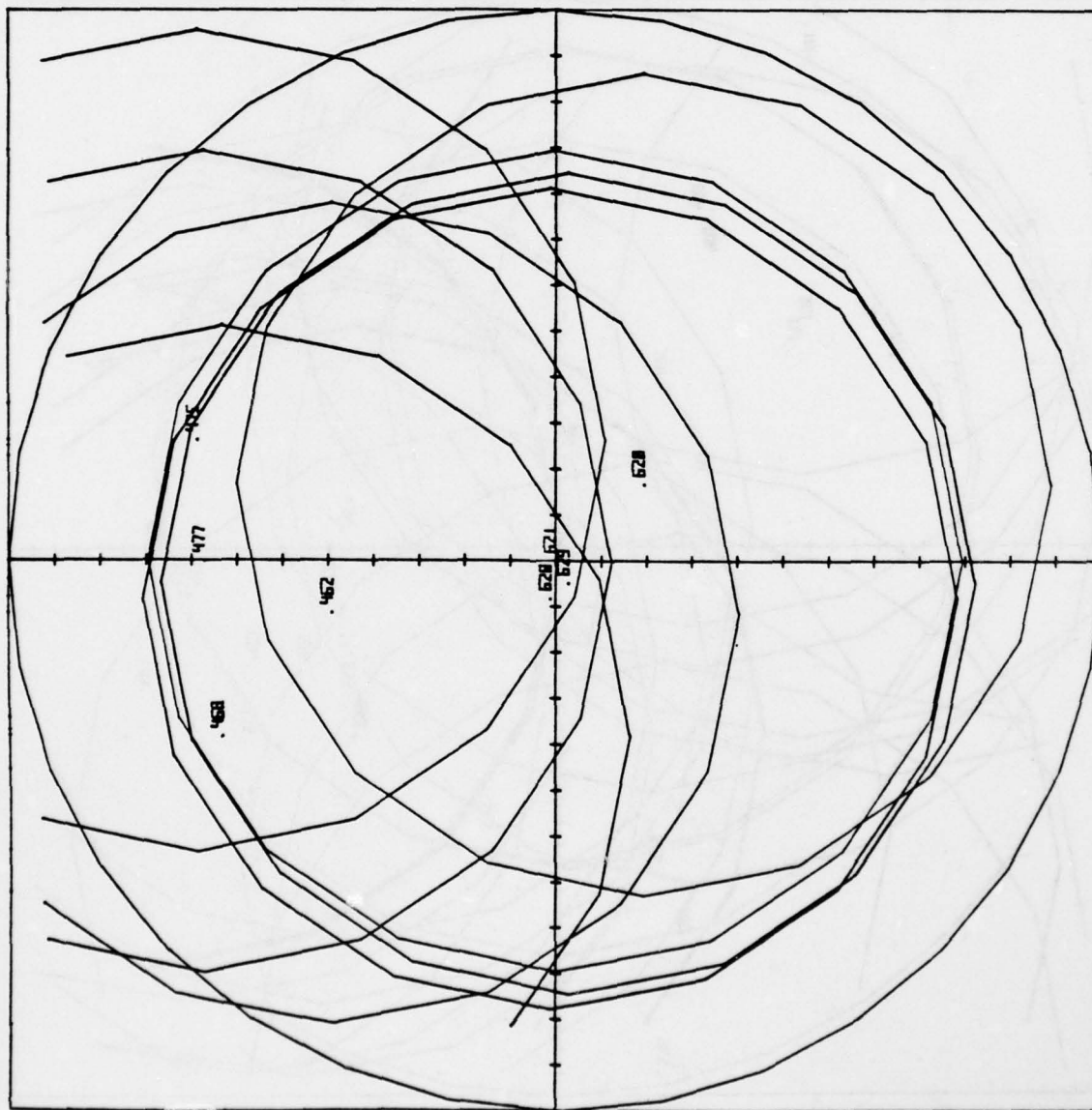


00100 4000 GIVES RADIOS 85, 44, 27, 15  
12 OF HERE RADIOS 100, 120

FILE # 621 USED AS NORMAL SITE

FILE # 462	WITHIN 25.14017801
FILE # 463	WITHIN 25.50372765
FILE # 464	WITHIN 25.25464906
FILE # 465	WITHIN 25.67912463
FILE # 466	WITHIN 25.85083328
FILE # 467	WITHIN 41.19722109
FILE # 468	WITHIN 94.82743445
FILE # 469	WITHIN 41.8525564
FILE # 470	WITHIN 39.55300327
FILE # 471	WITHIN 12.82851396
FILE # 472	WITHIN 0
FILE # 473	WITHIN 4.160590340
FILE # 474	WITHIN 2.351363390
FILE # 475	WITHIN 7.851363390
FILE # 476	WITHIN 4.160590340
FILE # 477	WITHIN 4.160590340





ELP

EL PASO, TEXAS

BL 1000 1000 GIVE PHOTOS 44.721.5555  
 LE OF MPER PHOTOS 44.721.5555

FILE # 621 USED NO INTERNAL SITE  
 PHOTOS # 462 WITHIN 25.14017001  
 PHOTOS # 463 WITHIN 41.15727104  
 PHOTOS # 475 WITHIN 41.15727104  
 PHOTOS # 477 WITHIN 38.55800527  
 PHOTOS # 620 WITHIN 12.62851376  
 PHOTOS # 621 WITHIN 0.0000  
 PHOTOS # 622 WITHIN 4.160590840  
 PHOTOS # 623 WITHIN 2.851963390  
 PHOTOS # 624 WITHIN 2.851963390  
 PHOTOS # 625 WITHIN 4.160590840  
 PHOTOS # 626 WITHIN 4.160590840  
 \*\*\*\*\*

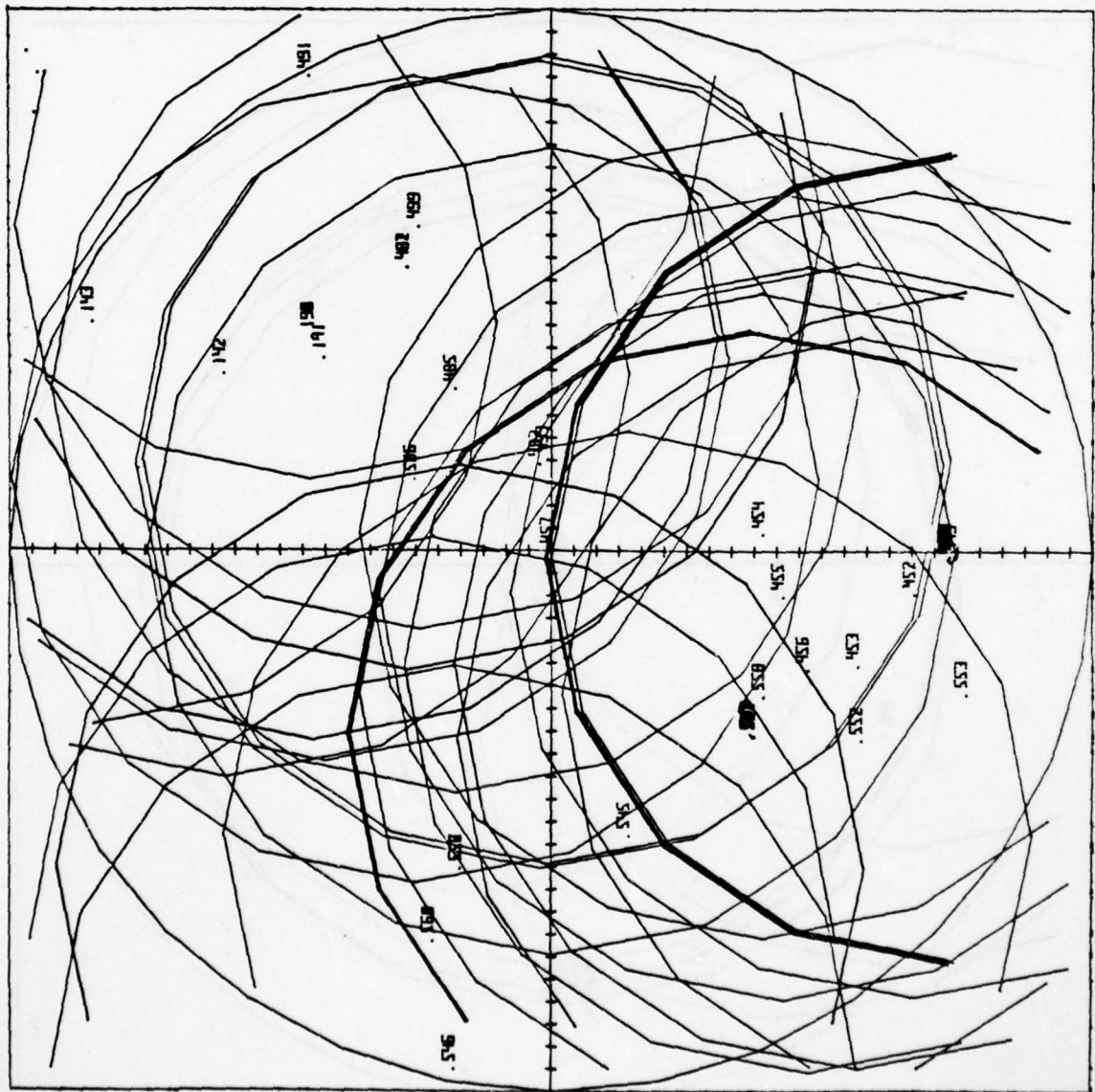


NEWARK, N. J.

JUL 4000 CIVILS FIDUCS 89.44274  
: OF 0814 FIDUCS 0814 > 120

L # 457 USAP W2 0001000 011E

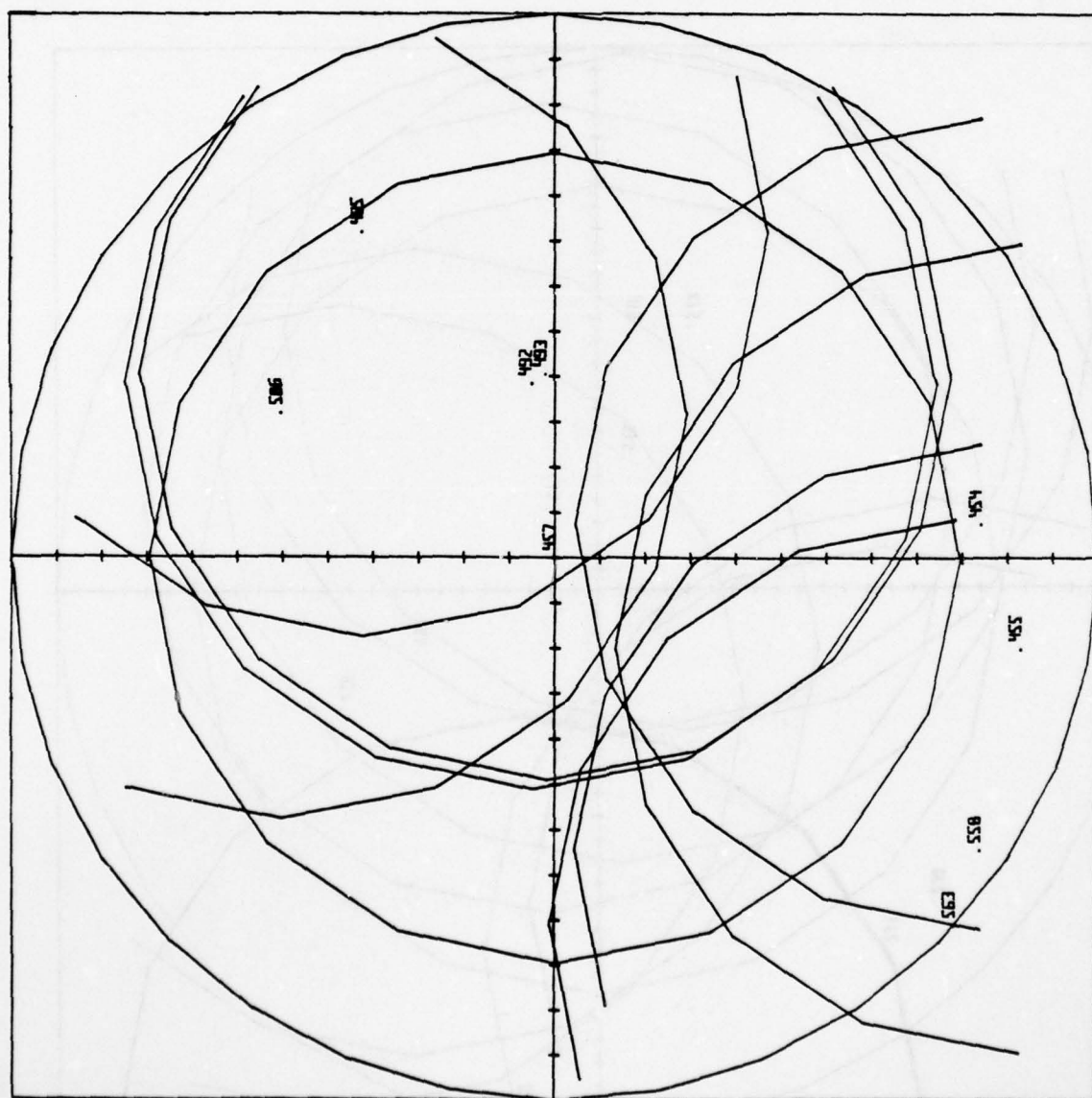
0000	# 139	000000	70.50816763	000
0000	# 140	000000	70.50816763	000
0000	# 141	000000	69.01825408	000
0000	# 142	000000	67.00622794	000
0000	# 143	000000	11.55110447	000
0000	# 446	000000	68.29014495	000
0000	# 447	000000	88.46383550	000
0000	# 448	000000	88.02121006	000
0000	# 449	000000	87.5176606	000
0000	# 450	000000	88.29014495	000
0000	# 451	000000	88.13265496	000
0000	# 452	000000	81.07930451	000
0000	# 453	000000	72.64305015	000
0000	# 454	000000	17.15613066	000
0000	# 455	000000	52.39440659	000
0000	# 456	000000	62.00020444	000
0000	# 457	000000	0	000
0000	# 458	000000	70.50401625	000
0000	# 459	000000	70.40740382	000
0000	# 460	000000	41.57955381	000
0000	# 461	000000	115.0038774	000
0000	# 462	000000	19.3881656	000
0000	# 463	000000	20.47119425	000
0000	# 464	000000	77.63301758	000
0000	# 465	000000	59.11263823	000
0000	# 466	000000	67.24303093	000
0000	# 467	000000	116.505479	000
0000	# 468	000000	100.50535411	000
0000	# 469	000000	97.16894099	000
0000	# 470	000000	74.00993086	000
0000	# 471	000000	74.00993086	000
0000	# 472	000000	74.00993086	000
0000	# 473	000000	90.21116147	000
0000	# 474	000000	90.50413796	000
0000	# 475	000000	100.50535411	000
0000	# 476	000000	59.40234011	000





EWR

NEWARK, N. J.



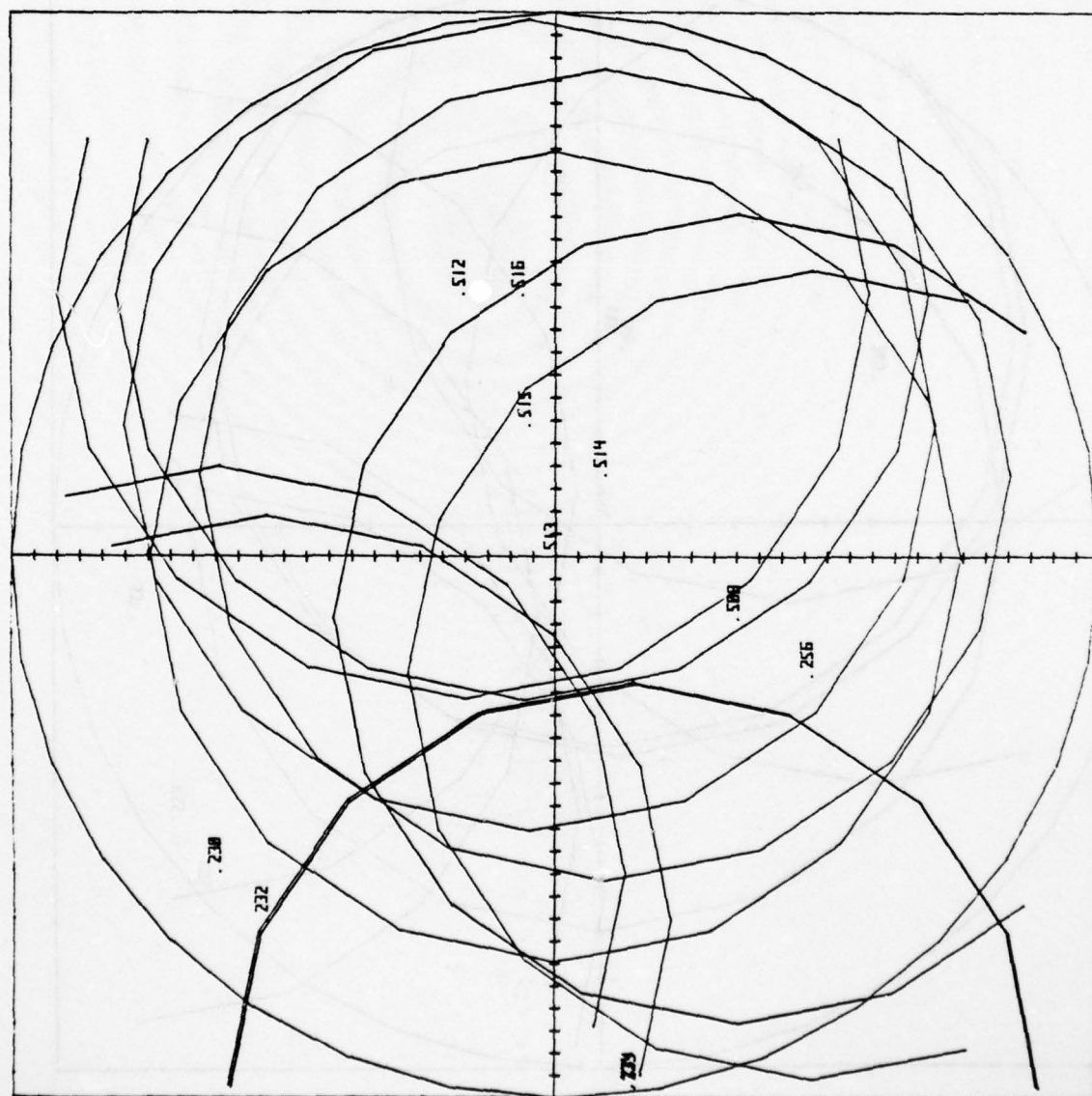
Point 1000 GIVES RADIUS 44.72135  
 .E OF AREA RADIUS 44.72135

LL # 457 USED AS NORMAL SITE

Radius # 454 RADIUS 42.15618066  
 Radius # 455 RADIUS 42.39544069  
 Radius # 457 RADIUS 0 IN  
 Radius # 482 RADIUS 41.79525881  
 Radius # 483 RADIUS 41.38981656  
 Radius # 493 RADIUS 39.2111725  
 Radius # 506 RADIUS 34.1263823  
 Radius # 558 RADIUS 56.47553758  
 Radius # 563 RADIUS 59.90234811  
 IN



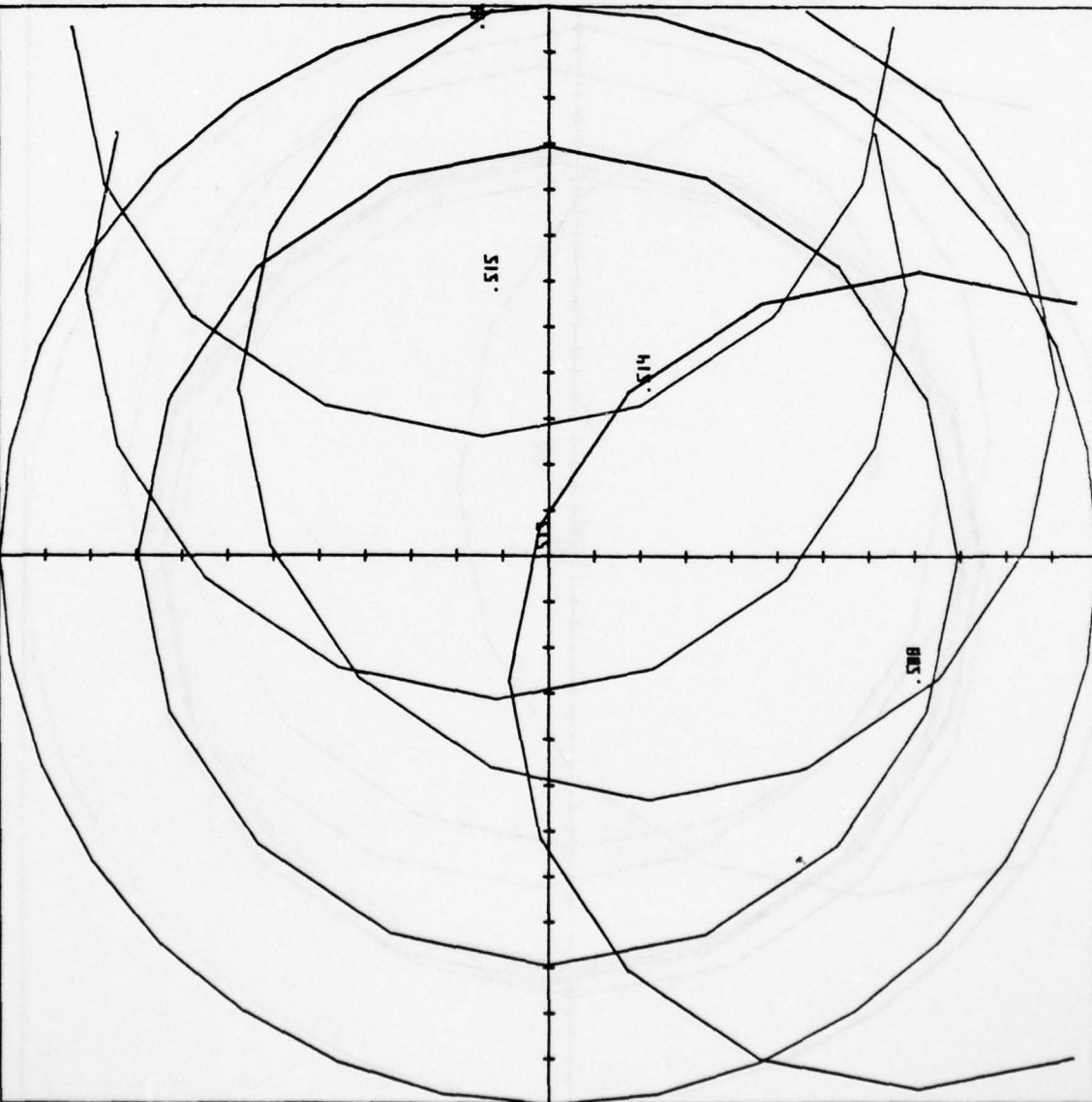
**DAYTON, OHIO**



THE TOLL 40000 51305 FPH005 89.44271  
 STATE OF NEW YORK FPH005 0000.170  
 TOLL # 513 USED FOR BODILY SIZE

Female	#	230	W10010	131.5	51.4	42.7
Female	#	231	W10010	10.5	52.6	32.7
Female	#	232	W10010	11.5	51.1	31.8
Female	#	234	W10010	11.3	51.6	34.5
Female	#	235	W10010	62.5	48.5	46.5
Female	#	240	W1010	42.5	16.3	39.5
Female	#	243	W10010	43.5	16.3	39.5
Female	#	512	W10010	61.5	42.6	34.6
Female	#	513	W10010	0	100	
Female	#	514	W10010	11.5	43.4	38.4
Female	#	515	W10010	36.5	47.5	45.5
Female	#	516	W10010	36.5	130.5	38.5





FFO

DAYTON, OHIO

35955

WPER (RADIUS) 1000000  
WPER (RADIUS) 1000000

FILE HS NORTON SITE 513  
USED HS NORTON SITE

508	WITHIN 42.71618392	MM
509	WITHIN 42.71618392	MM
513	WITHIN 0	MM
514	WITHIN 21.24841784	MM
515	WITHIN 29.57281453	MM
516	WITHIN 56.15853073	MM



**SPOKANE, WASH.**

U.S. 4000 GIVE FIDUCES 33.77.12.1  
L OF HELH FIDUCES . 11.1.12.1

3115 THURMAN ST DESO # 7

10-11-1967

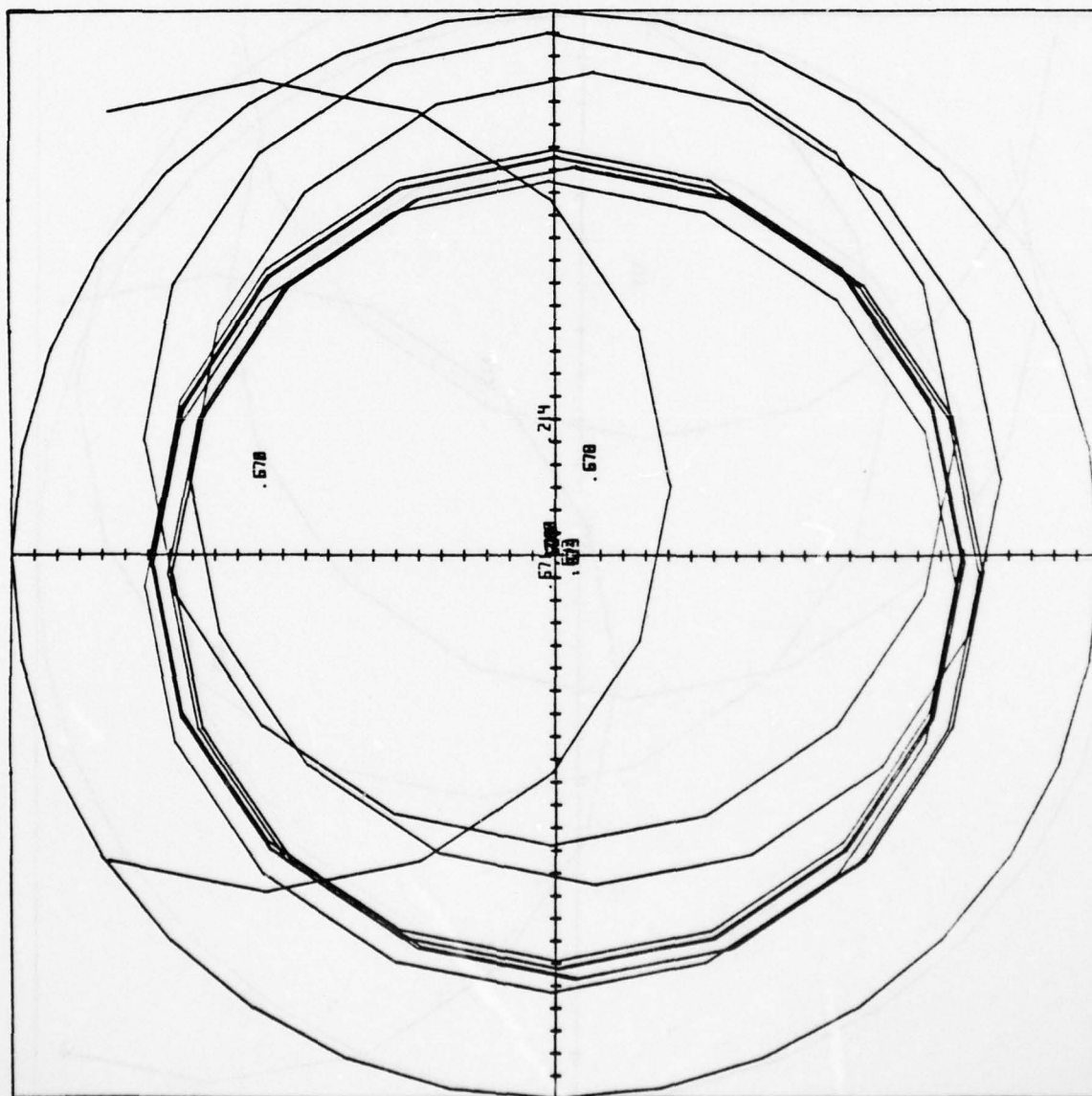
1500000000	11111111	11111111	11111111
0000000000	00000000	00000000	00000000

[illegible]

Case	Year	Age	Sex	Occupation
1	1978	45	M	Teacher
2	1979	32	F	Homemaker
3	1980	58	M	Engineer
4	1981	25	F	Nurse
5	1982	65	M	Retired
6	1983	40	F	Manager
7	1984	35	M	Student
8	1985	50	F	Writer
9	1986	28	M	Artist
10	1987	60	F	Scientist
11	1988	42	M	Lawyer
12	1989	38	F	Doctor
13	1990	55	M	Businessman
14	1991	30	F	Teacher
15	1992	62	M	Engineer
16	1993	27	F	Nurse
17	1994	53	M	Retired
18	1995	41	F	Manager
19	1996	36	M	Student
20	1997	51	F	Writer
21	1998	29	M	Artist
22	1999	59	F	Scientist
23	2000	43	M	Lawyer
24	2001	39	F	Doctor
25	2002	56	M	Businessman
26	2003	31	F	Teacher
27	2004	61	M	Engineer
28	2005	26	F	Nurse
29	2006	54	M	Retired
30	2007	44	F	Manager
31	2008	37	M	Student
32	2009	52	F	Writer
33	2010	33	M	Artist
34	2011	63	F	Scientist
35	2012	46	M	Lawyer
36	2013	40	F	Doctor
37	2014	57	M	Businessman
38	2015	34	F	Teacher
39	2016	64	M	Engineer
40	2017	29	F	Nurse
41	2018	55	M	Retired
42	2019	45	F	Manager
43	2020	38	M	Student
44	2021	53	F	Writer
45	2022	32	M	Artist
46	2023	62	F	Scientist
47	2024	47	M	Lawyer
48	2025	41	F	Doctor
49	2026	58	M	Businessman
50	2027	35	F	Teacher
51	2028	65	M	Engineer
52	2029	30	F	Nurse
53	2030	56	M	Retired
54	2031	42	F	Manager
55	2032	36	M	Student
56	2033	51	F	Writer
57	2034	33	M	Artist
58	2035	63	F	Scientist
59	2036	48	M	Lawyer
60	2037	42	F	Doctor
61	2038	59	M	Businessman
62	2039	37	F	Teacher
63	2040	67	M	Engineer
64	2041	31	F	Nurse
65	2042	57	M	Retired
66	2043	43	F	Manager
67	2044	37	M	Student
68	2045	52	F	Writer
69	2046	34	M	Artist
70	2047	64	F	Scientist
71	2048	49	M	Lawyer
72	2049	43	F	Doctor
73	2050	60	M	Businessman
74	2051	38	F	Teacher
75	2052	68	M	Engineer
76	2053	32	F	Nurse
77	2054	58	M	Retired
78	2055	44	F	Manager
79	2056	38	M	Student
80	2057	53	F	Writer
81	2058	35	M	Artist
82	2059	65	F	Scientist
83	2060	50	M	Lawyer
84	2061	44	F	Doctor
85	2062	61	M	Businessman
86	2063	39	F	Teacher
87	2064	69	M	Engineer
88				

[illegible]

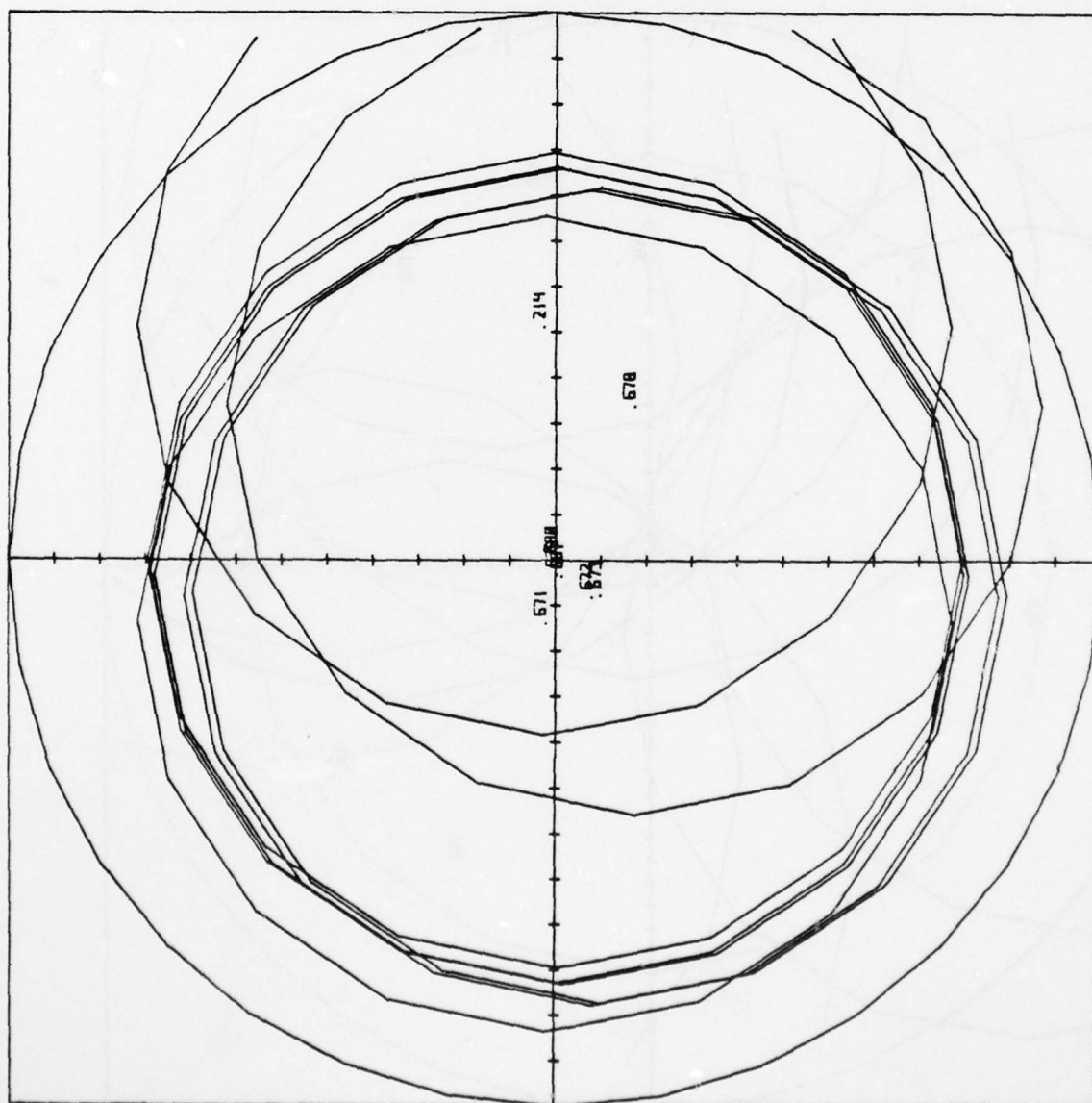
011706061111M



D-64



**SPOKANE, WASH.**



D-65

10000 44,721399  
 10000 44,721399

# 6001 11-20-63 100111L SITE

SECRET 111111 17 481111

[illegible]

PL 100-507  
11111  
100-507

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

[illegible]

0-67-1055

... ..

[illegible]



AD-A061 948

FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFIC--ETC F/G 17/7  
FAA BCAS CONCEPT. VOLUME IIIA. APPENDICES A-E, (U)  
APR 78 E J KOENKE

UNCLASSIFIED

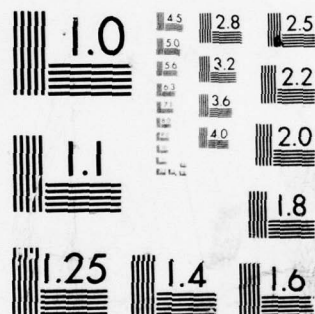
FAA-EM-78-5-III-A

NL

3 OF 5  
AD  
A061 948







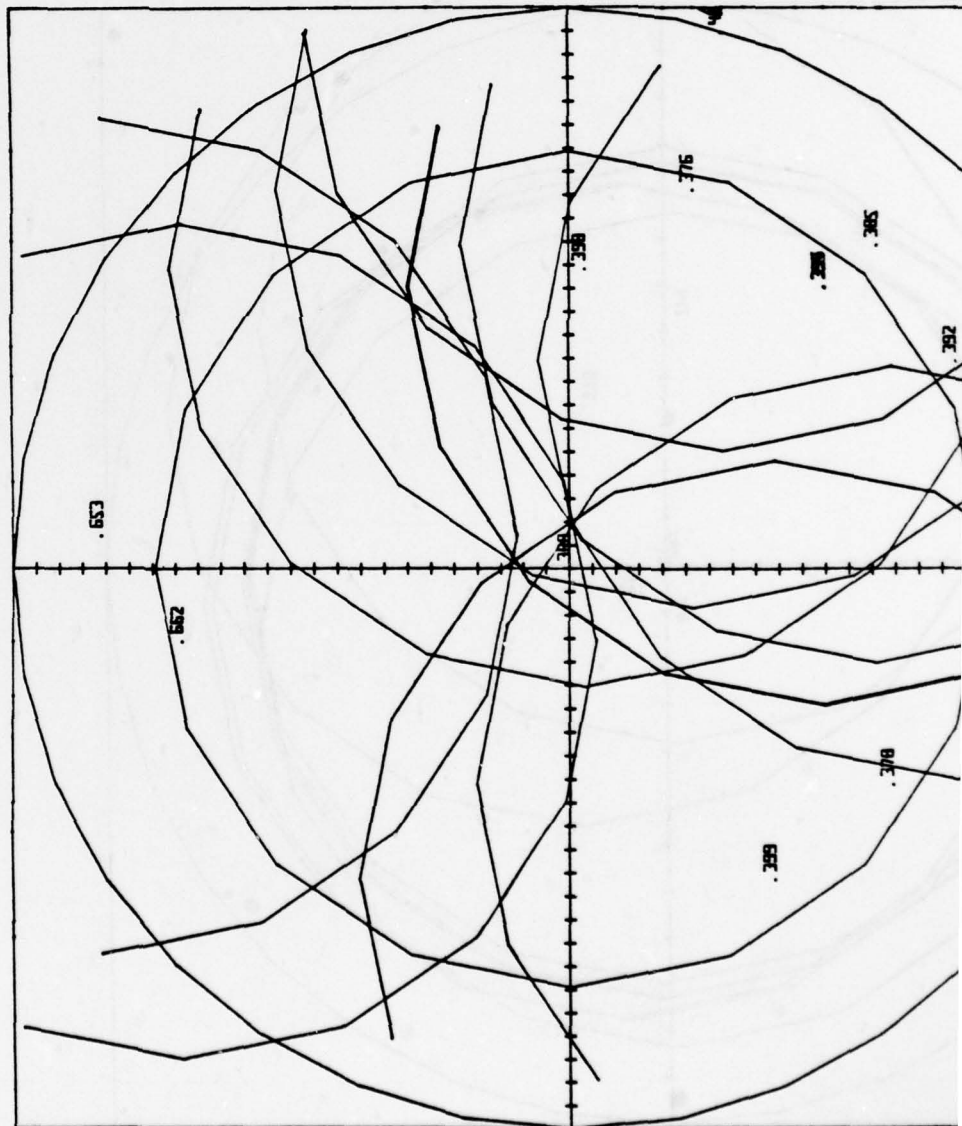
MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A



GREENSBORO, N. C.

1001 4000 CIVE RADIOS 89.4427  
21 of 1000 RADIOS 0000 100

WILL # 388 USED AS NOMINAL SITE

[illegible]

D-66



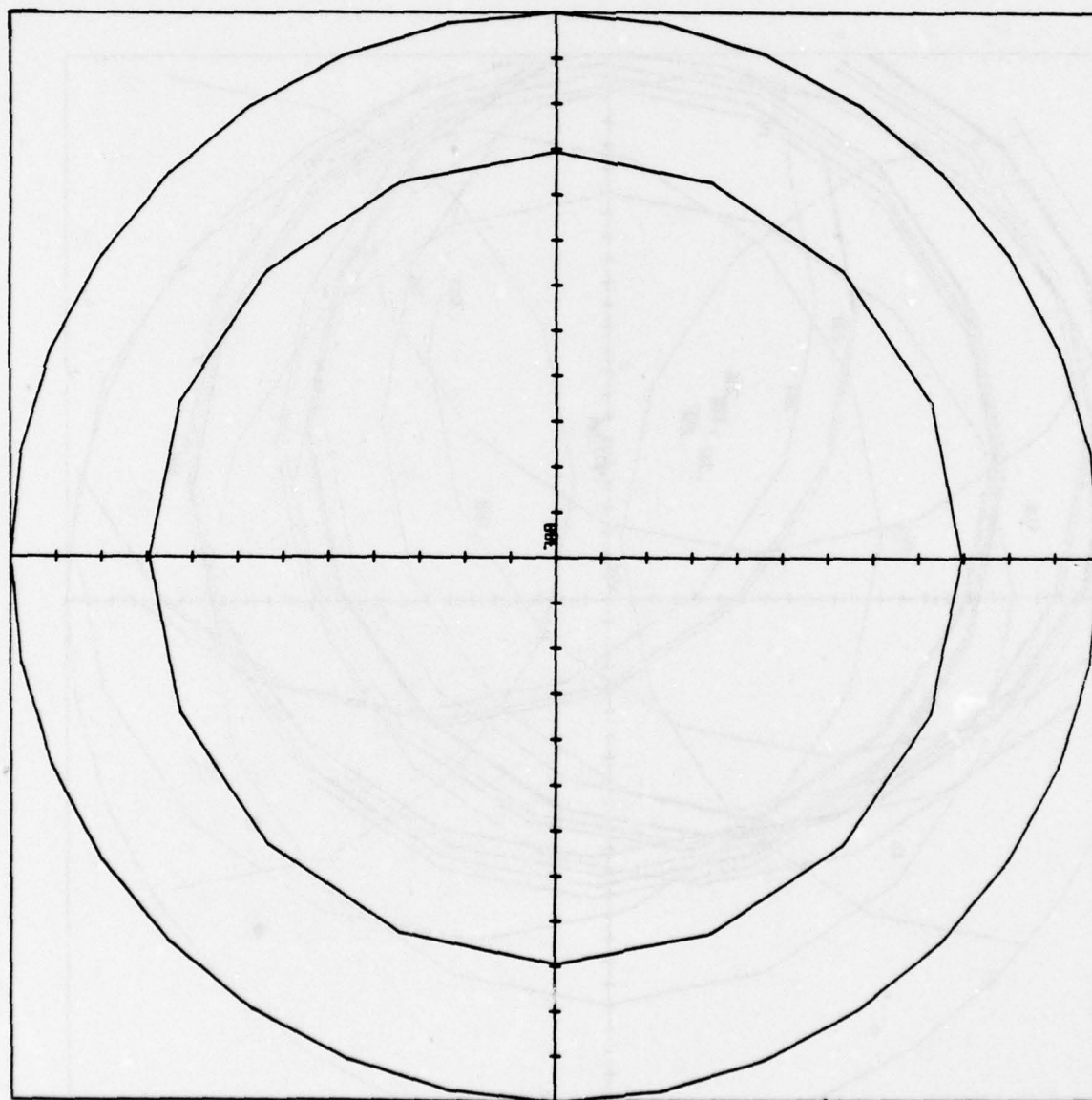
6 S 0

GREENSBORO, N. C.

1941 1000 GIVE RADIOS 44.72135  
10 OF GREEN RADIOS 1000 20

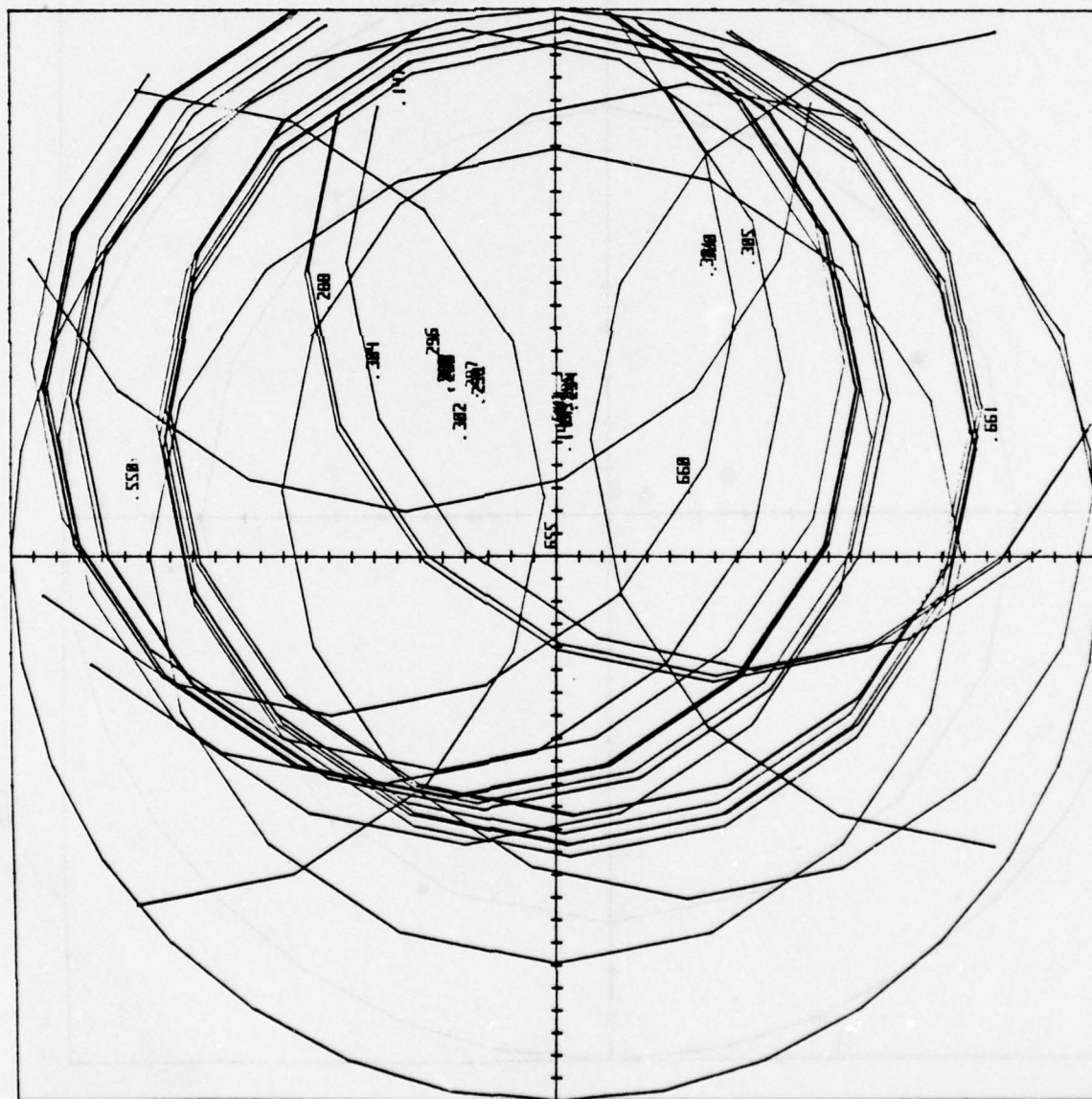
E # 308 USED AS HORIZONTAL SITE

GROUP # 388 WITHIN 10 100  
100 1000 1000 1000 1000





WASH DULLES, VA.



44 100 4000 CIVE, PHILUS 05-44271  
TITLE OF REPA PHILUS 44- 120

3115 TOTTENHAM ST. JENNY 659 # 311

Female	# 144	W1H10	26.1	30.1	17.5
Female	# 145	W1H10	36.4	50.4	26.0
Female	# 146	W1H10	37.4	54.4	30.5
Female	# 147	W1H10	104.7	73.7	48.9
Female	# 203	W1H10	73.3	77.0	60.1
Female	# 204	W1H10	47.4	54.4	41.4
Female	# 290	W1H10	47.4	76.5	51.3
Female	# 291	W1H10	43.4	43.4	41.4
Female	# 292	W1H10	43.4	48.0	32.4
Female	# 293	W1H10	43.4	43.4	41.4
Female	# 294	W1H10	33.4	41.4	14.0
Female	# 295	W1H10	47.4	63.4	56.4
Female	# 296	W1H10	47.4	57.4	36.4
Female	# 297	W1H10	79.4	50.0	31.0
Female	# 298	W1H10	37.4	42.4	31.3
Female	# 299	W1H10	37.4	44.4	32.1
Female	# 300	W1H10	37.4	40.4	32.4
Female	# 301	W1H10	47.4	53.4	53.1
Female	# 302	W1H10	33.4	40.4	40.7
Female	# 303	W1H10	33.4	37.4	32.4
Female	# 304	W1H10	57.4	50.4	47.4
Female	# 305	W1H10	33.4	33.4	33.0
Female	# 330	W1H10	47.4	51.4	44.8
Female	# 335	W1H10	37.4	43.4	31.0
Female	# 336	W1H10	100.4	52.4	36.4
Female	# 337	W1H10	100.4	52.4	36.4



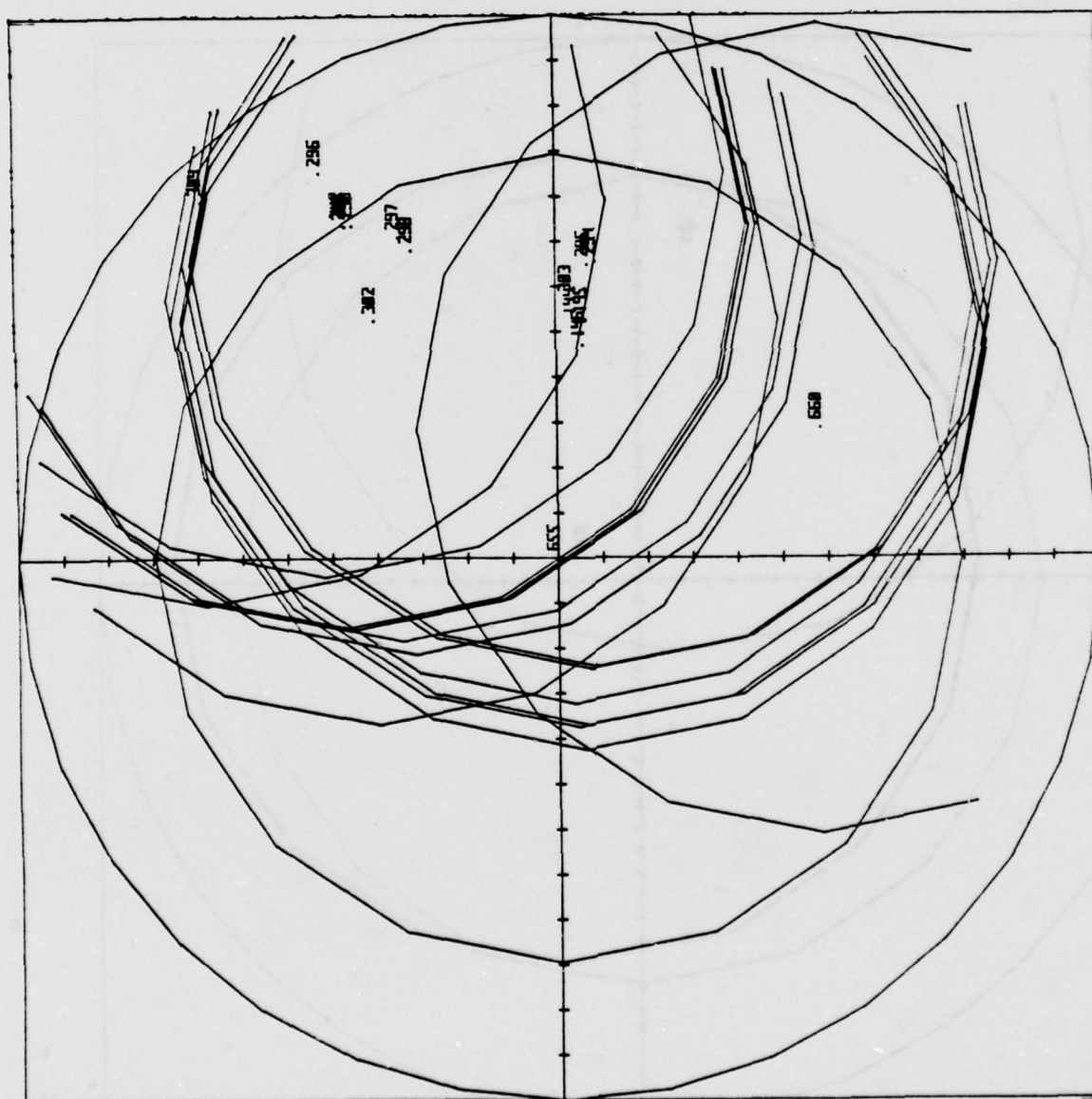
1 A D

WASH DULLES, VA.

FLIGHT 1000 GIVES PROBUS 44.72105944  
 I.E. OF HPER (PROBUS - HM) 60

ILE # 655 USED NO NOMINAL SITE

PROB # 144	WITHIN 26.13021754	144
PROB # 145	WITHIN 26.46507620	145
PROB # 146	WITHIN 23.70445055	146
PROB # 189	WITHIN 43.47984914	189
PROB # 290	WITHIN 43.15853177	290
PROB # 291	WITHIN 43.42984914	291
PROB # 292	WITHIN 43.88003524	292
PROB # 293	WITHIN 43.47084914	293
PROB # 294	WITHIN 32.91461410	294
PROB # 295	WITHIN 32.63190629	295
PROB # 296	WITHIN 49.92450969	296
PROB # 297	WITHIN 39.55740107	297
PROB # 298	WITHIN 37.58476513	298
PROB # 299	WITHIN 37.58476513	299
PROB # 302	WITHIN 33.06408173	302
PROB # 303	WITHIN 33.05377329	303
PROB # 304	WITHIN 33.05377329	304
PROB # 655	WITHIN 0 NM	655
PROB # 656	WITHIN 32.48142110	656





IAH

HOUSTON, TEXAS

HEIGHT 4000 GIVE: EARTH 88.44271  
SIZE OF AREA (PHOTO) 120

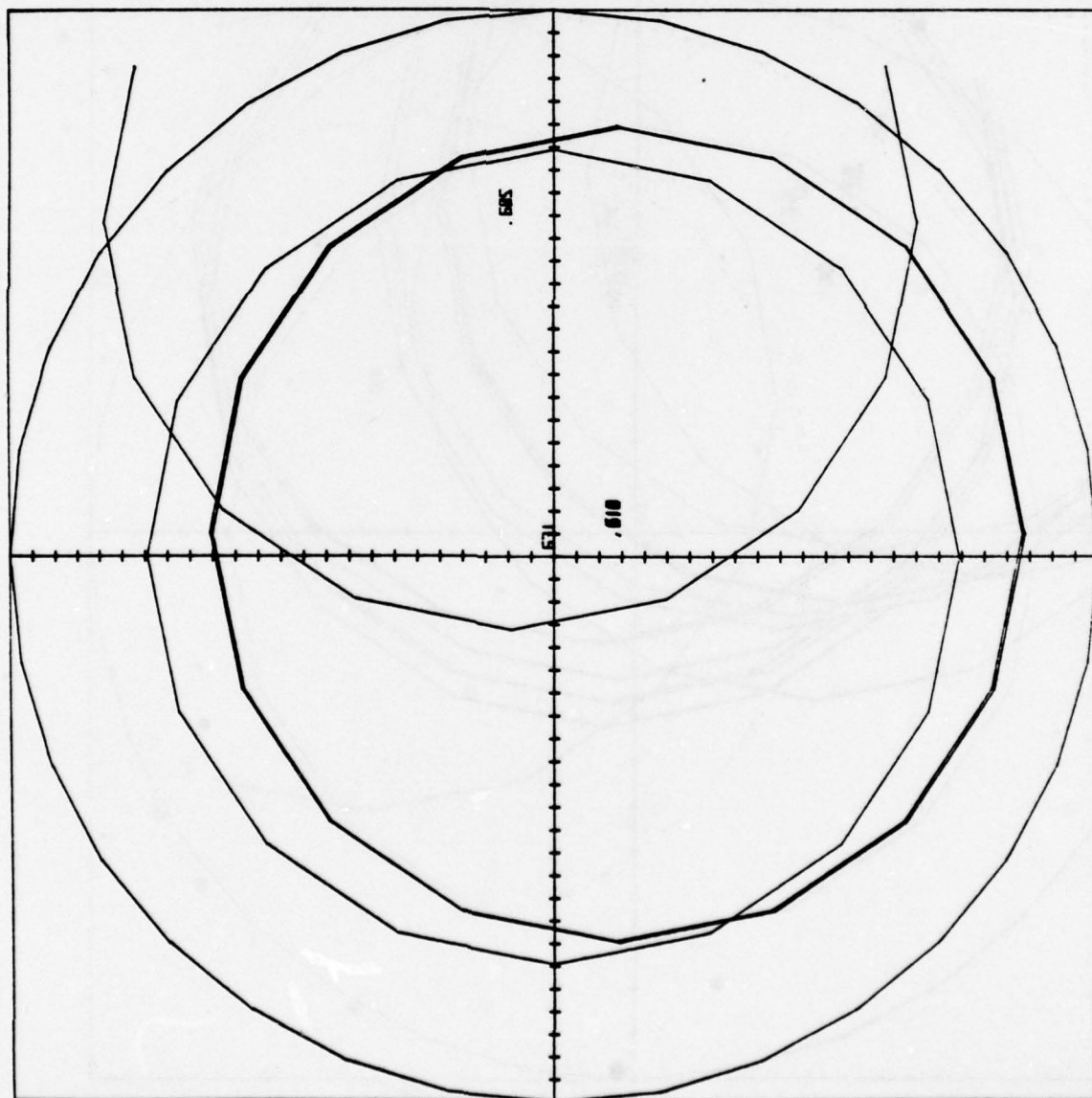
FILE # 631 USED AS NORMAL SITE

FRAME # 605 WITHIN 73.938341

FRAME # 618 WITHIN 15.207879

FRAME # 619 WITHIN 14.76700465

FRAME # 631 WITHIN 0 NH  
\*\*\*\* \*\*\*\*\* \*\*\*\*

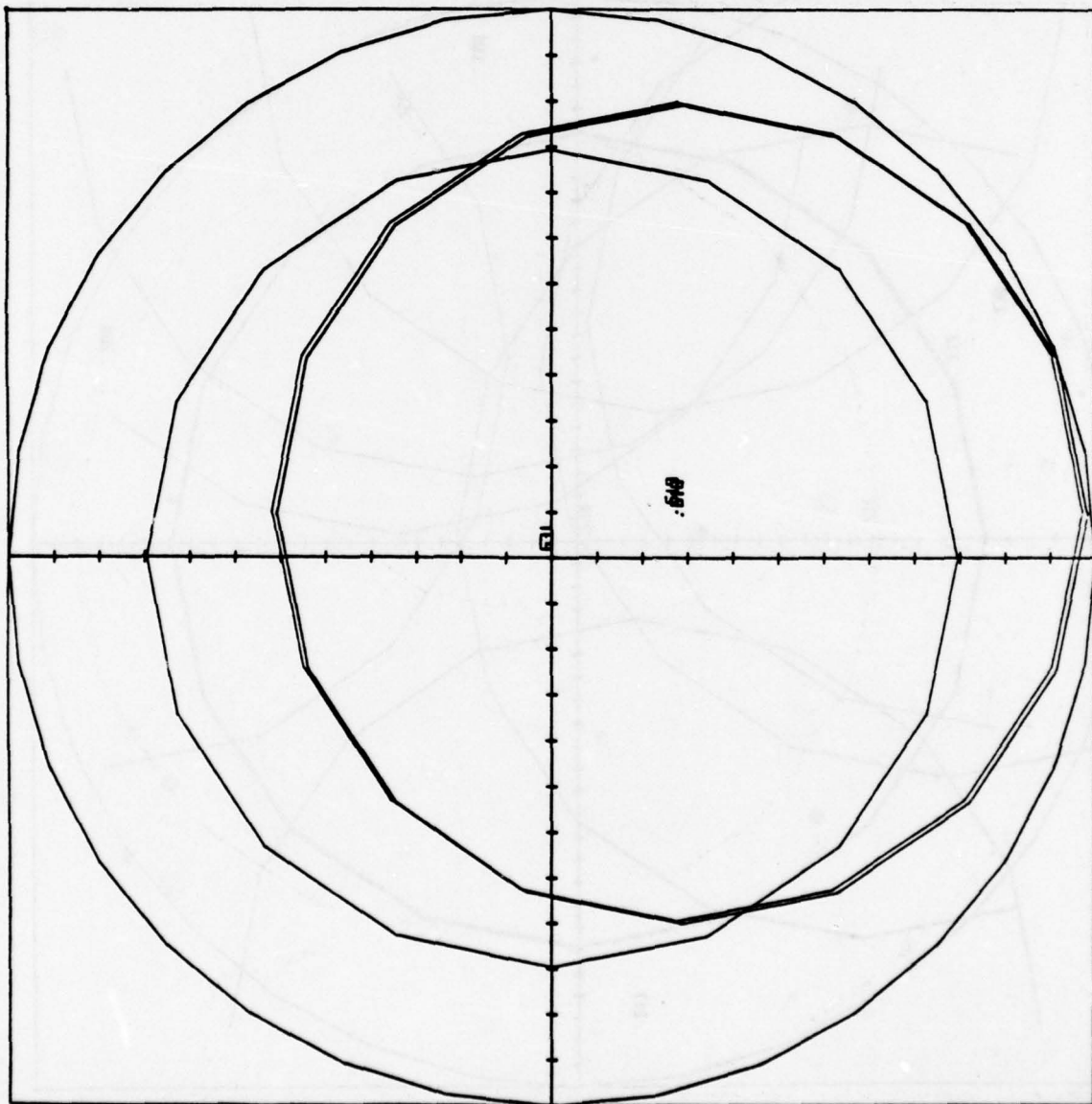




IAH

HOUSTON, TEXAS

ICHI 1000 GIVES RADIUS 44.721333°  
E OF AREA <RADIUS> 60  
E # 631 USED AS HORIZONTAL SITE  
GROUP # 610 WITHIN 15.2072879  
GROUP # 619 WITHIN 14.12700465  
GROUP # 631 WITHIN 0 RM  
.. \*\*\*\*\*





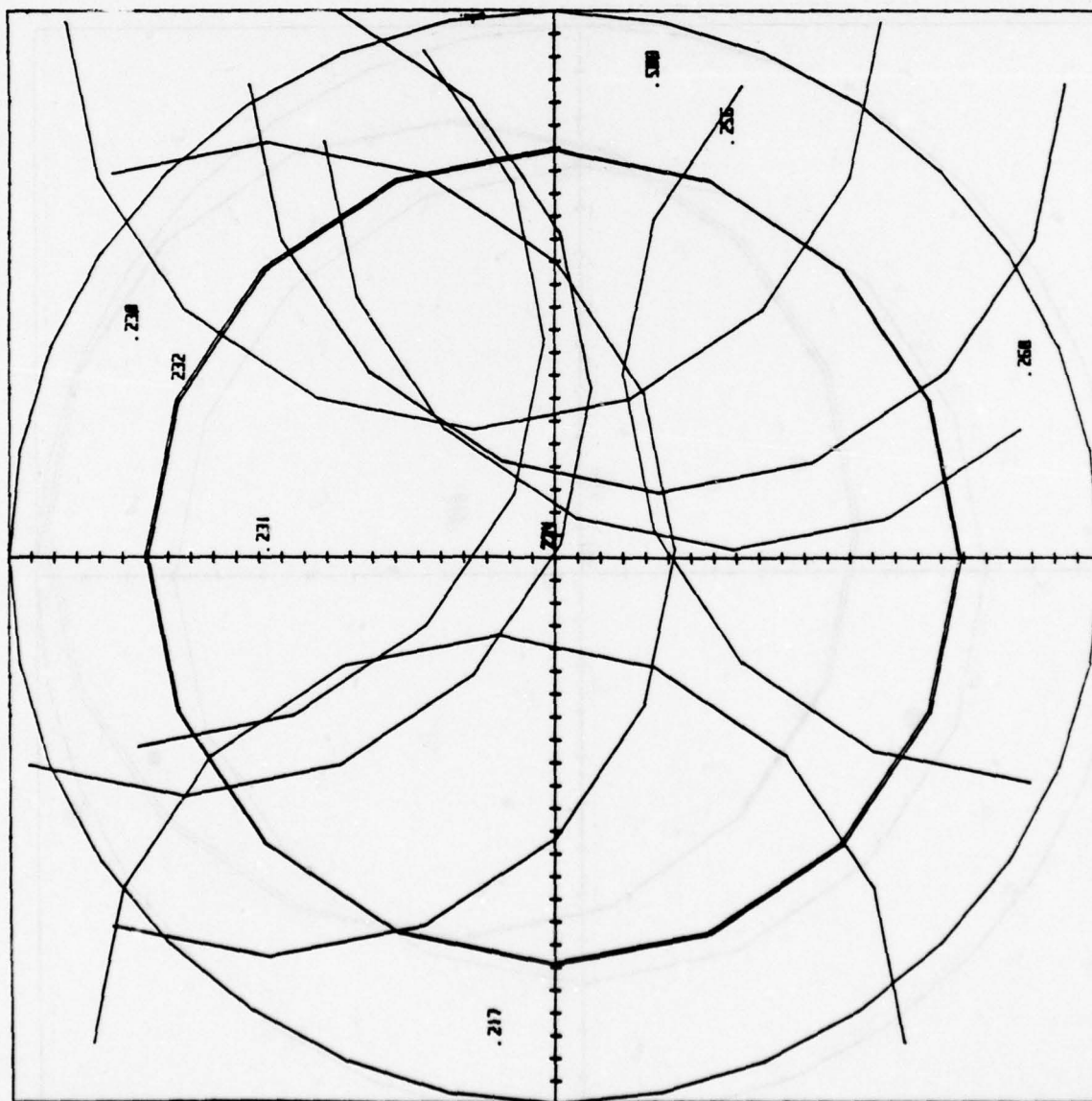
IND

INDIANAPOLIS, INDIANA

IN 1000 4000 GIVES RADIUS 89.442715  
 SIZE OF AREA (RADIUS 1000) 120

FILE # 233 USED AS NOMINAL SITE

RADIUS # 217	WITHIN 107.3795003	I
RADIUS # 230	WITHIN 103.5051786	I
RADIUS # 231	WITHIN 63.06661605	N
RADIUS # 232	WITHIN 84.5335644	N
RADIUS # 233	WITHIN 0	III
RADIUS # 234	WITHIN 0.688993157	N
RADIUS # 250	WITHIN 99.3662412	N
RADIUS # 260	WITHIN 111.9125610	N
RADIUS # 500	WITHIN 106.2216282	N
RADIUS # 509	WITHIN 106.3216282	N
RADIUS # 513	WITHIN 118.821103	N





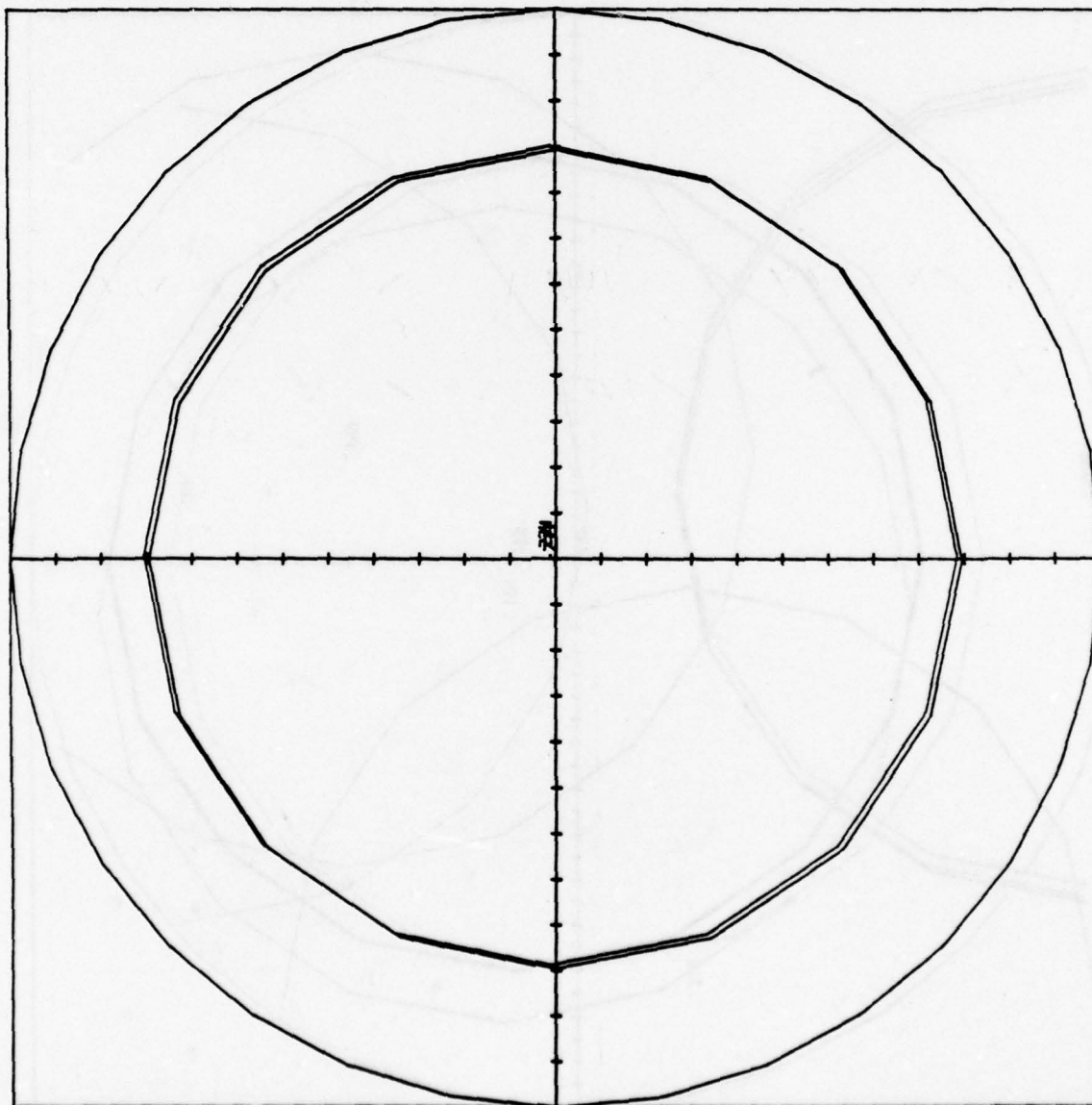
IND

INDIANAPOLIS, INDIANA

GHT 1000 GIVES PHOTUS 44.72135  
E OF HKEH PHOTUS 44.72135

E # 233 USED AS NOMINAL SITE

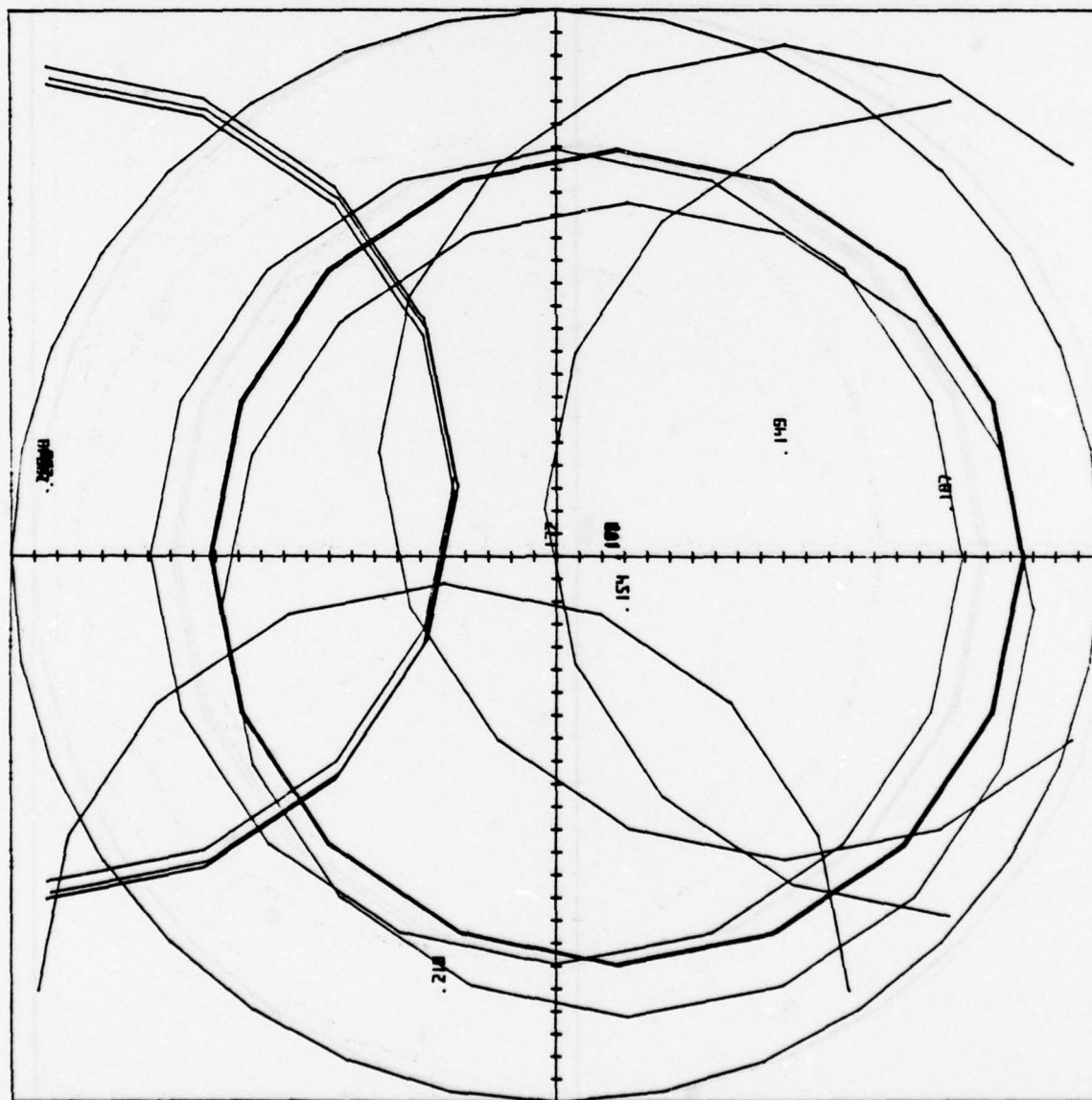
PHOTUS # 233 WITHIN 0 IN  
PHOTUS # 234 WITHIN 0.000998157  
\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\*





JAX

JACKSONVILLE, FLORIDA



FILE # 172 USED AS NOMINAL SITE

FILE # 149	WITHIN 95.01700000	N
FILE # 154	WITHIN 19.55392005	N
FILE # 169	WITHIN 13.99180497	N
FILE # 170	WITHIN 13.94466804	N
FILE # 171	WITHIN 13.70164573	N
FILE # 172	WITHIN 9	NH
FILE # 187	WITHIN 87.40457879	N
FILE # 197	WITHIN 112.893491	N
FILE # 205	WITHIN 112.893491	N
FILE # 206	WITHIN 112.1957044	N
FILE # 208	WITHIN 113.2978108	N
FILE # 210	WITHIN 90.54790275	N



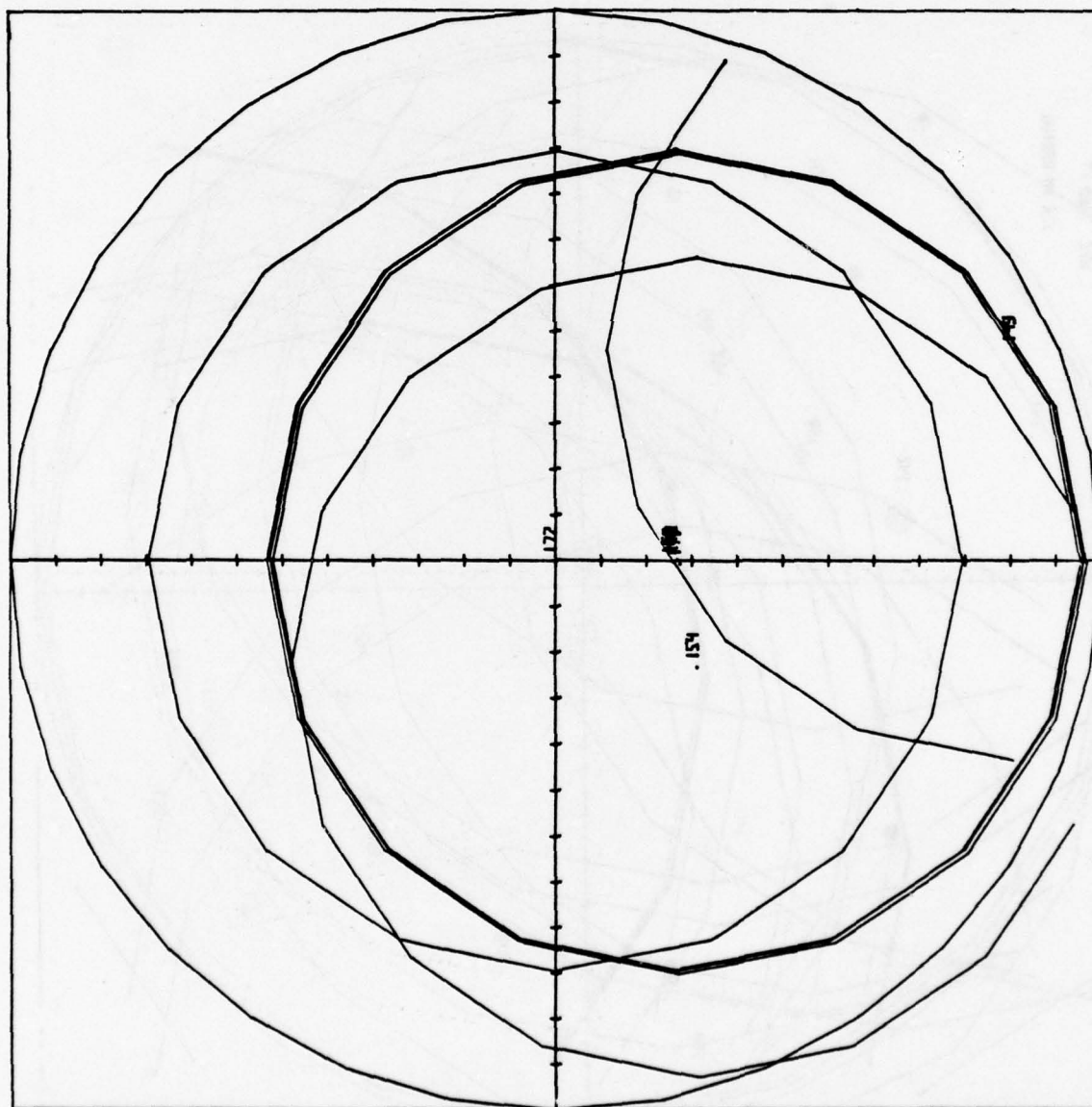
JAX

JACKSONVILLE, FLORIDA

1 LIGHT 1000 GIVES RADIUS 44.7213  
 2 LE OF AREA < RADIUS (NM) > 60

3 LE # 172 USED AS NOMINAL SITE

4 RADIUS # 149 WITHIN 15.32120880  
 5 RADIUS # 154 WITHIN 14.55393205  
 6 RADIUS # 169 WITHIN 12.95190497  
 7 RADIUS # 170 WITHIN 13.34486804  
 8 RADIUS # 171 WITHIN 13.70194573  
 9 RADIUS # 172 WITHIN 0 NM  
 \*\* \*\*\*\*\* \*\*\*\*\*



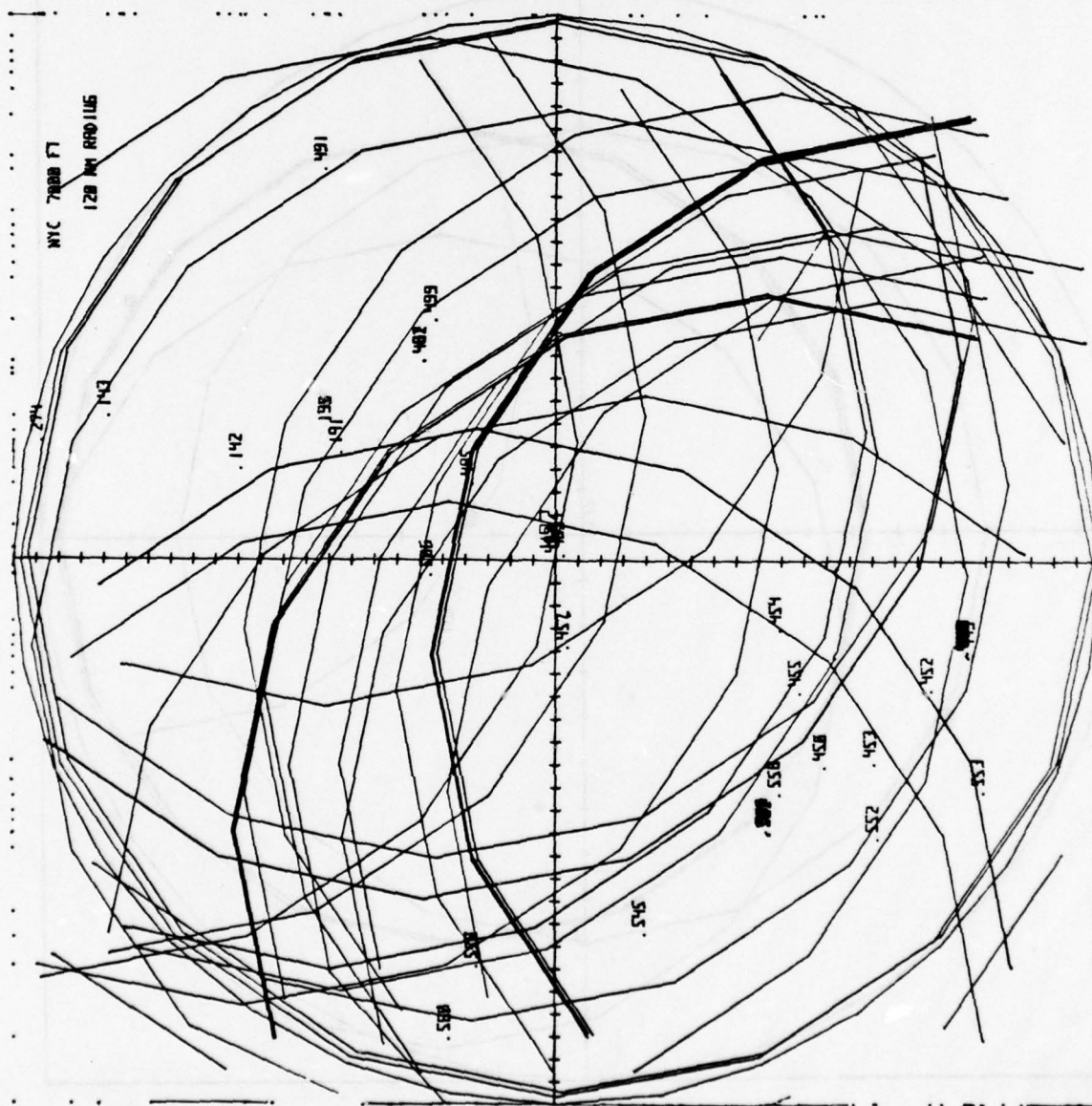


JOHN F. KENNEDY, N. Y. C.

# THE LULL

VALUE OF HEN (PENCE) FROM 1900.

FILE # 492 USED AS HOMIHL SITE


$$170 \text{ Nm} = 36 \text{ rad/s}$$



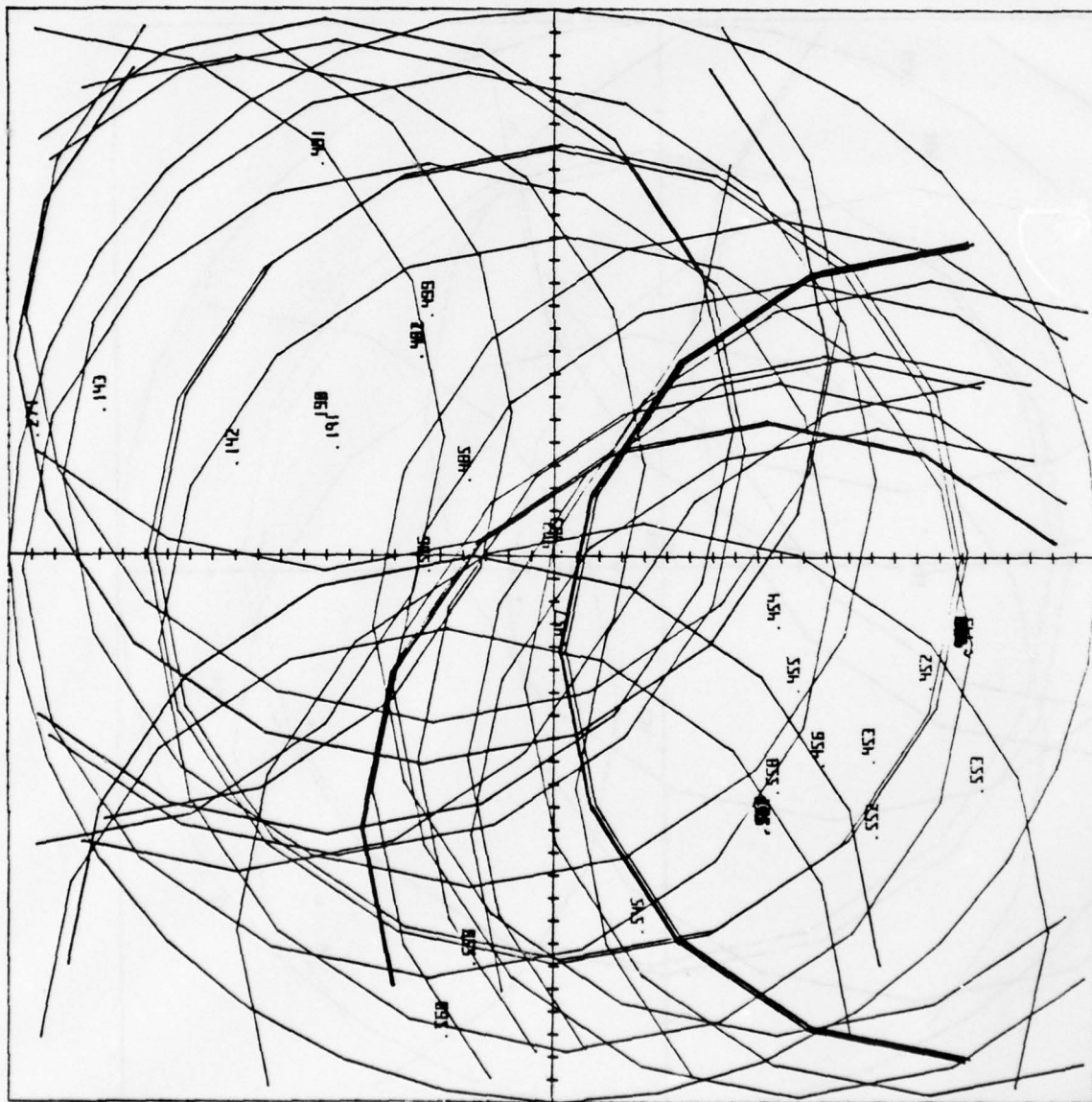
JFK

JOHN F. KENNEDY, N. Y. C.

RIGHT 4000 6175 PHOTOS 89,44271910  
 SIZE OF AREA PHOTOS 100/120

FILE # 492 USED AS BOUNDARY SITE

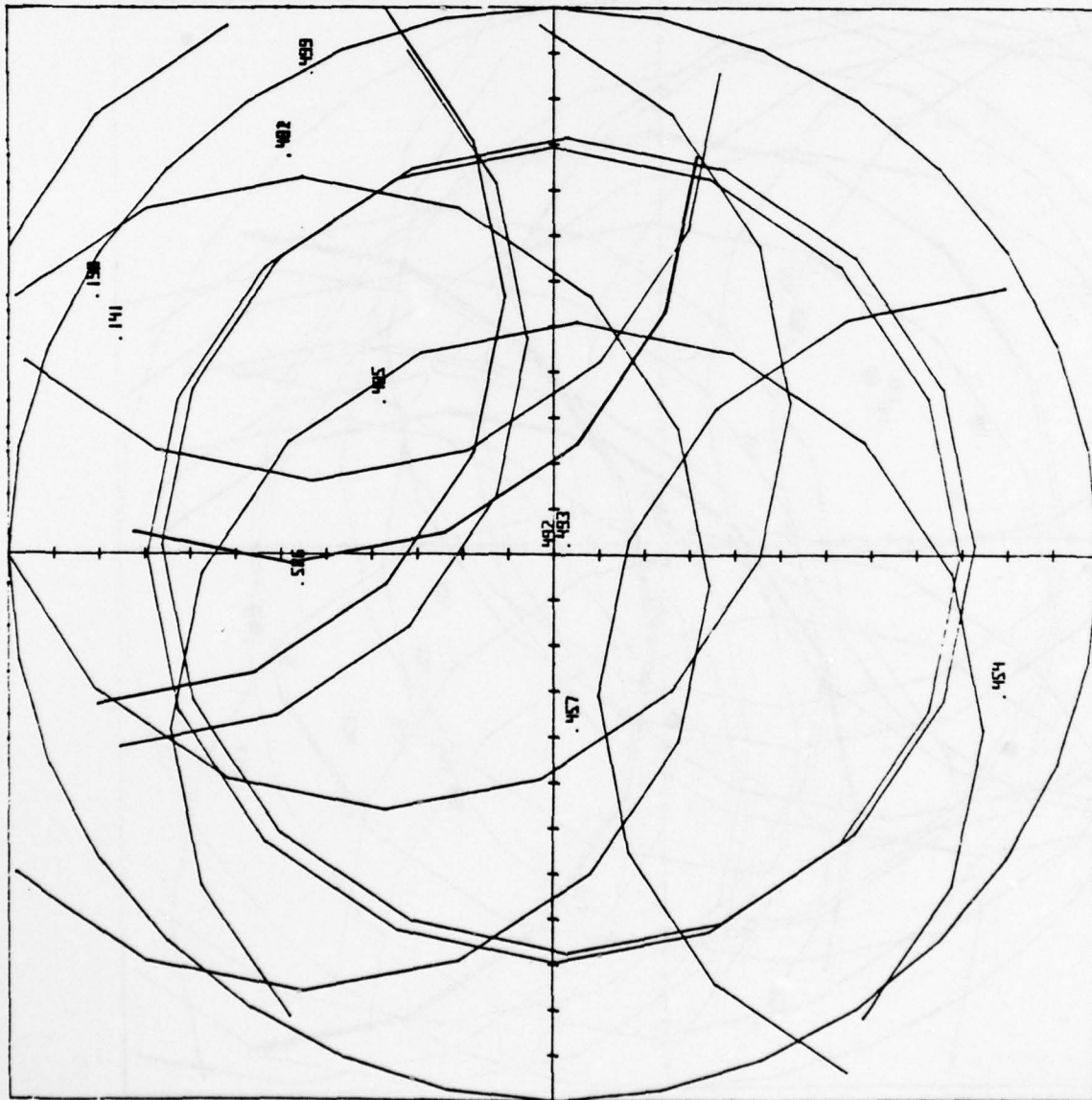
PHOTO # 134	WITHIN 57,561,000.00	100
PHOTO # 140	WITHIN 57,561,000.00	
PHOTO # 141	WITHIN 58,154,451.00	
PHOTO # 142	WITHIN 58,447,120.00	
PHOTO # 143	WITHIN 107,000,191.9	
PHOTO # 274	WITHIN 116,095,881.7	
PHOTO # 446	WITHIN 93,129,602.1	
PHOTO # 447	WITHIN 93,531,362.6	
PHOTO # 448	WITHIN 42,545,045.4	
PHOTO # 449	WITHIN 44,411,456.34	
PHOTO # 450	WITHIN 73,129,602.1	
PHOTO # 451	WITHIN 93,129,602.1	
PHOTO # 452	WITHIN 87,466,837.7	
PHOTO # 453	WITHIN 88,609,100.5	
PHOTO # 454	WITHIN 51,563,005.44	
PHOTO # 455	WITHIN 61,400,000.00	
PHOTO # 456	WITHIN 54,524,117.5	
PHOTO # 457	WITHIN 19,398,165.6	
PHOTO # 481	WITHIN 52,567,39.84	
PHOTO # 482	WITHIN 52,497,456.4	
PHOTO # 483	WITHIN 55,048,400.8	
PHOTO # 491	WITHIN 49,079,666.7	
PHOTO # 492	WITHIN 0	100
PHOTO # 493	WITHIN 1,911,871,026	
PHOTO # 494	WITHIN 59,068,115.4	
PHOTO # 500	WITHIN 57,561,000.00	
PHOTO # 545	WITHIN 44,505,000.00	
PHOTO # 550	WITHIN 44,000,000.00	
PHOTO # 551	WITHIN 107,000,191.9	
PHOTO # 552	WITHIN 41,100,000.00	
PHOTO # 553	WITHIN 41,100,000.00	
PHOTO # 554	WITHIN 41,100,000.00	
PHOTO # 555	WITHIN 41,100,000.00	
PHOTO # 556	WITHIN 41,100,000.00	
PHOTO # 557	WITHIN 41,100,000.00	
PHOTO # 558	WITHIN 41,100,000.00	
PHOTO # 559	WITHIN 100,100,000.00	
PHOTO # 560	WITHIN 100,100,000.00	
PHOTO # 561	WITHIN 100,100,000.00	
PHOTO # 562	WITHIN 100,100,000.00	
PHOTO # 563	WITHIN 100,100,000.00	





JFK

JOHN F. KENNEDY, N. Y. C.

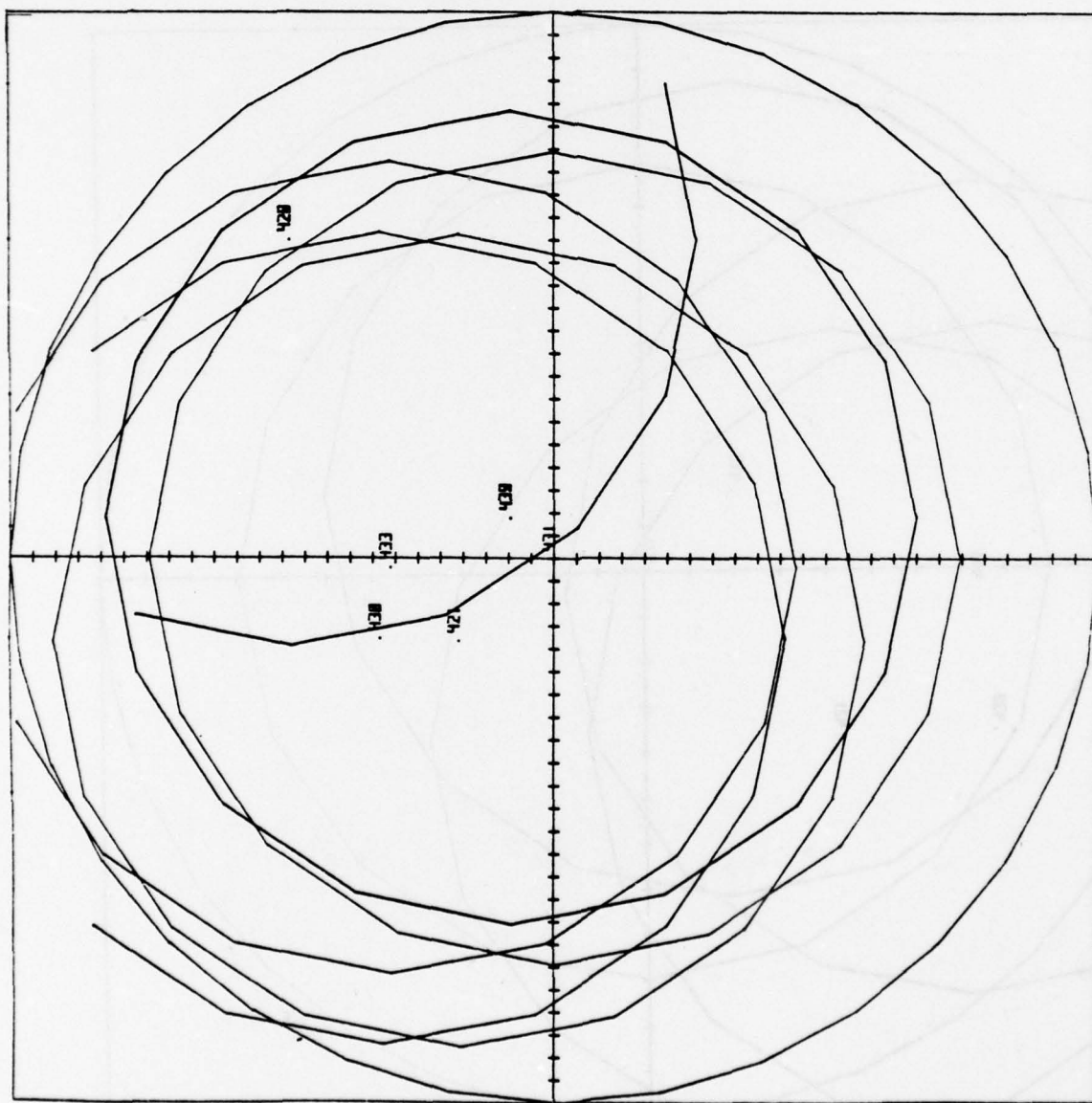


FLIGHT 1000 GIVES RADIOS 44.7213  
 LCL OF HELM RADIOS (HH) 60  
 ILE # 492 USED AS RADIAL SITE  
 PHOP # 134 WITHIN 57.56110066  
 PHOP # 140 WITHIN 57.56110066  
 PHOP # 141 WITHIN 53.15934510  
 PHOP # 454 WITHIN 51.56370544  
 PHOP # 457 WITHIN 14.39881656  
 PHOP # 481 WITHIN 52.45737939  
 PHOP # 482 WITHIN 52.44977964  
 PHOP # 483 WITHIN 25.04349008  
 PHOP # 492 WITHIN 0  
 PHOP # 493 WITHIN 1.31137136  
 PHOP # 494 WITHIN 54.0034134  
 PHOP # 500 WITHIN 27.76998293  
 ... \*\*\*\*\*



LAS

LAS VEGAS, NEV.



HEIGHT 4000 GIVES RADIUS 89.442719  
 SIZE OF AREA RADIUS 100.120

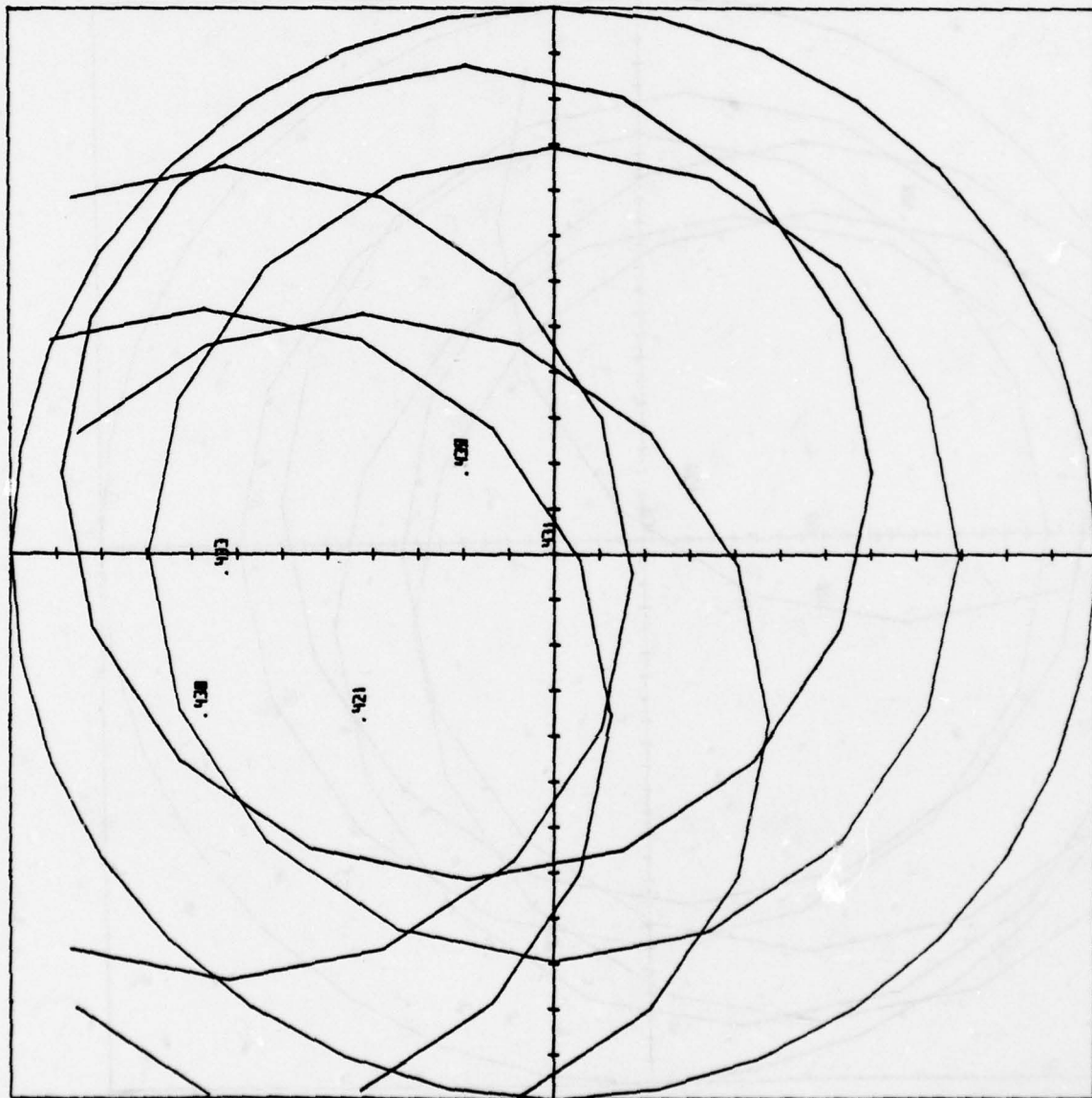
FILE # 431 USED AS INITIAL SITE

Point # 421	WITHIN 27.8756790	N
Point # 424	WITHIN 91.00661115	N
Point # 425	WITHIN 91.00661115	N
Point # 426	WITHIN 91.00661115	N
Point # 430	WITHIN 42.30475432	N
Point # 431	WITHIN 0	N
Point # 432	WITHIN 13.10822802	N
Point # 433	WITHIN 36.1176478	N
Point # 434	WITHIN 13.10822802	N
Point # 435	WITHIN 13.10822802	N



LAS

LAS VEGAS, NEV.



HEIGHT 1000 GIVES RADIUS 44.7213595  
 SIZE OF AREA RADIUS 44.7213595

FILE # 431 USED AS NOMINAL SITE

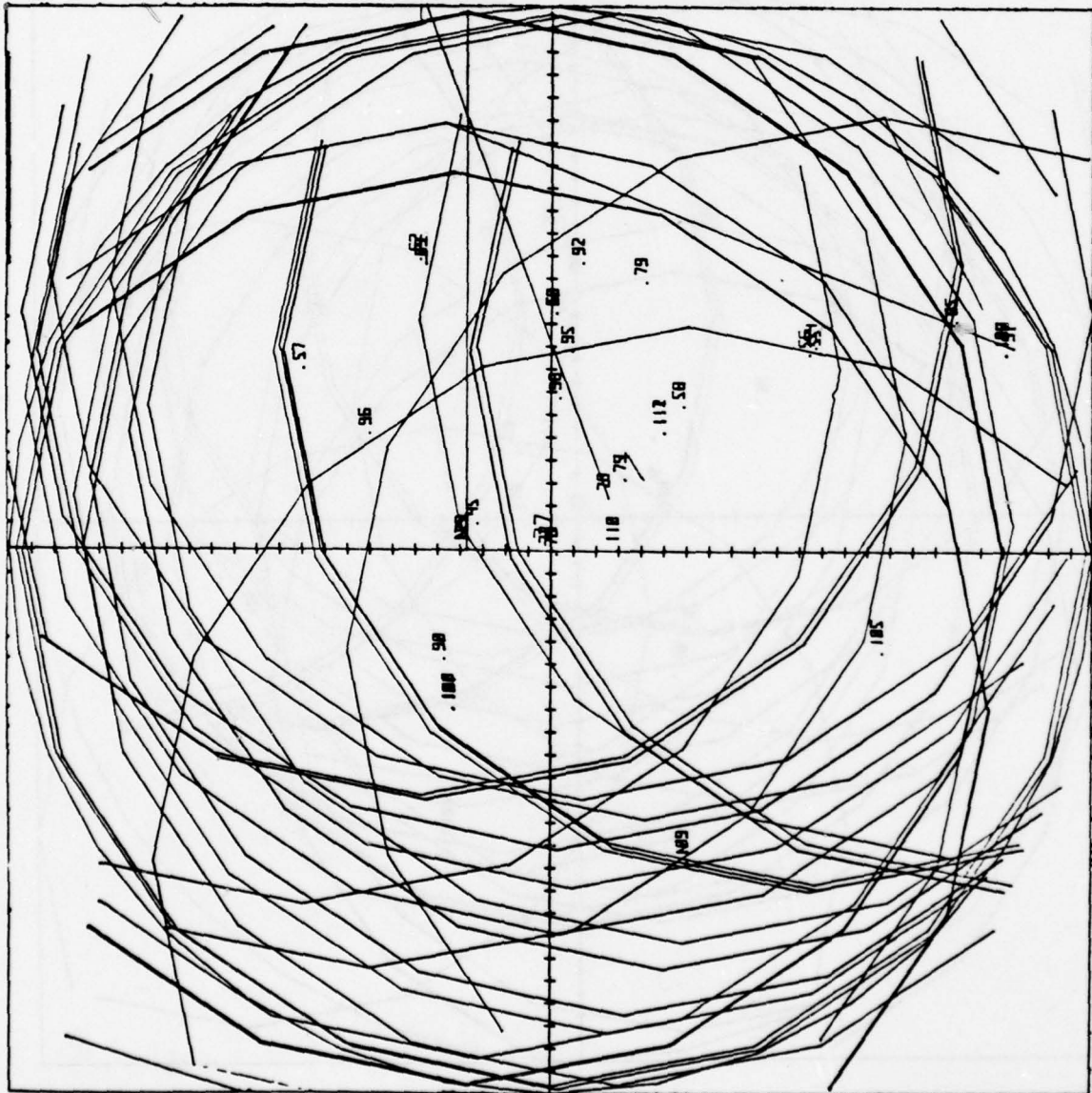
RADIUS # 421	WIDTH 27.83756790	IN
RADIUS # 430	WIDTH 42.30975432	IN
RADIUS # 431	WIDTH 0	IN
RADIUS # 432	WIDTH 13.10822902	IN
RADIUS # 433	WIDTH 36.1176478	IN
RADIUS # 434	WIDTH 13.10822902	IN
RADIUS # 435	WIDTH 13.10822902	IN
****	****	****



LOS ANGELES, CALIF.

211

FILE # 77 USED AS HOMINAL SITE

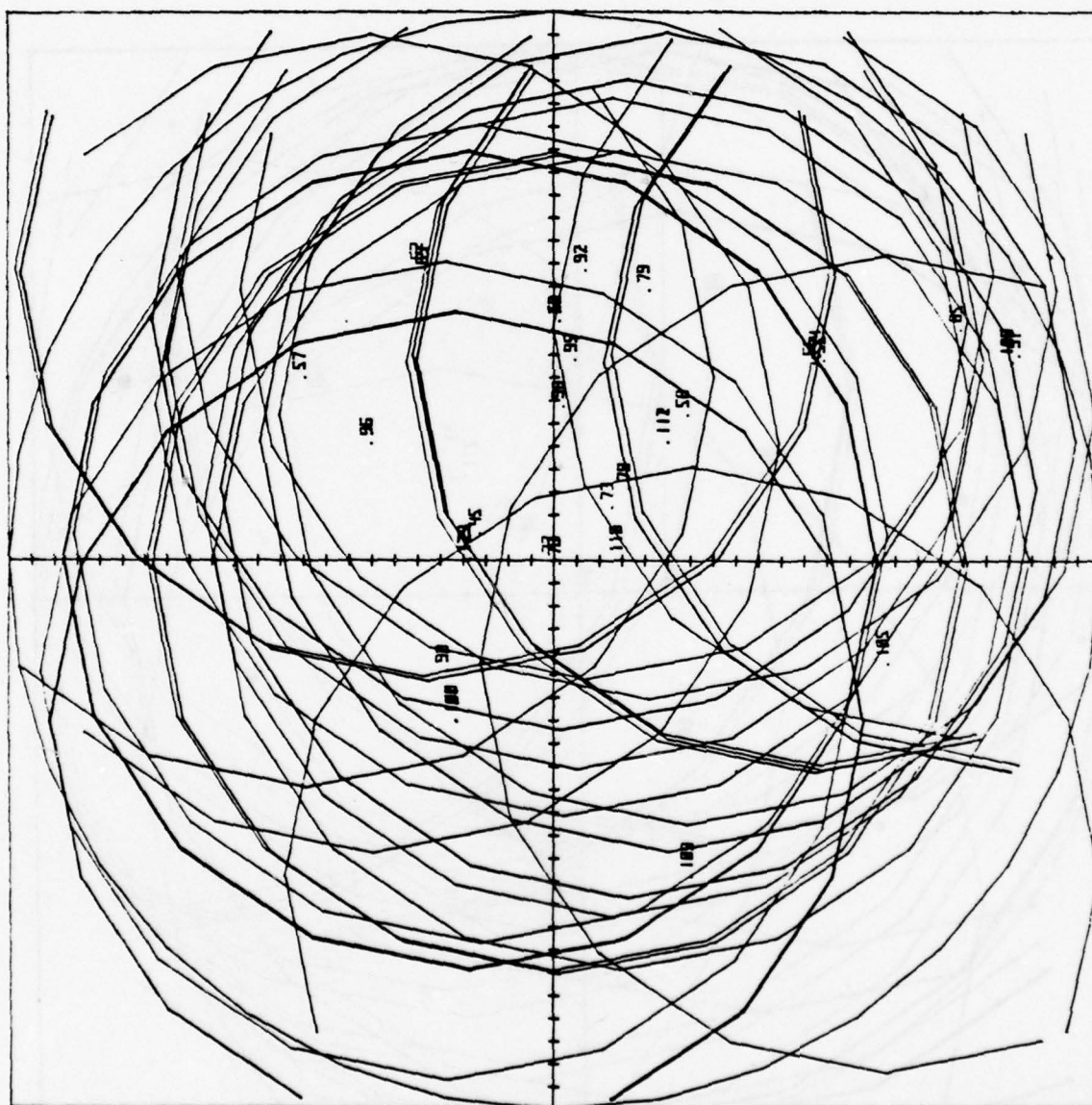
[illegible] $120 \text{ Nm} = 30 \text{ m} \cdot \text{kg} \cdot \text{s}^{-2}$ 



LOS ANGELES, CALIF.

FILE # 77 USED AS HONOLULU SITE

Primer # 45	WT1111	17,156,072,250
Primer # 54	WT1111	73,744,804,043
Primer # 55	WT1111	73,767,735
Primer # 56	WT1111	71,773,865
Primer # 57	WT1111	67,526,805,946
Primer # 58	WT1111	63,332,857,774
Primer # 59	WT1111	52,433,047,300
Primer # 60	WT1111	52,433,047,300
Primer # 62	WT1111	70,300,140,708
Primer # 63	WT1111	68,894,128,877
Primer # 64	WT1111	68,894,128,877
Primer # 73	WT1111	17,706,944,635
Primer # 74	WT1111	22,815,551,616
Primer # 75	WT1111	22,815,551,616
Primer # 76	WT1111	1,436,368,751
Primer # 77	WT1111	0
Primer # 79	WT1111	62,749,293,936
Primer # 85	WT1111	102,704,646,566
Primer # 90	WT1111	33,649,602,538
Primer # 91	WT1111	111,572,526,7
Primer # 92	WT1111	41,361,900,383
Primer # 95	WT1111	42,204,106,119
Primer # 96	WT1111	44,445,264,92
Primer # 98	WT1111	33,812,263,18
Primer # 100	WT1111	41,023,903,23
Primer # 101	WT1111	41,149,36,76
Primer # 105	WT1111	70,670,78,92
Primer # 106	WT1111	100,439,412
Primer # 107	WT1111	100,439,412
Primer # 108	WT1111	100,439,412
Primer # 109	WT1111	100,439,412
Primer # 110	WT1111	14,304,758,82
Primer # 111	WT1111	8,164,217,9
Primer # 113	WT1111	8,164,217,9
Primer # 123	WT1111	130,440,173
Primer # 124	WT1111	130,440,173
Primer # 125	WT1111	130,440,173



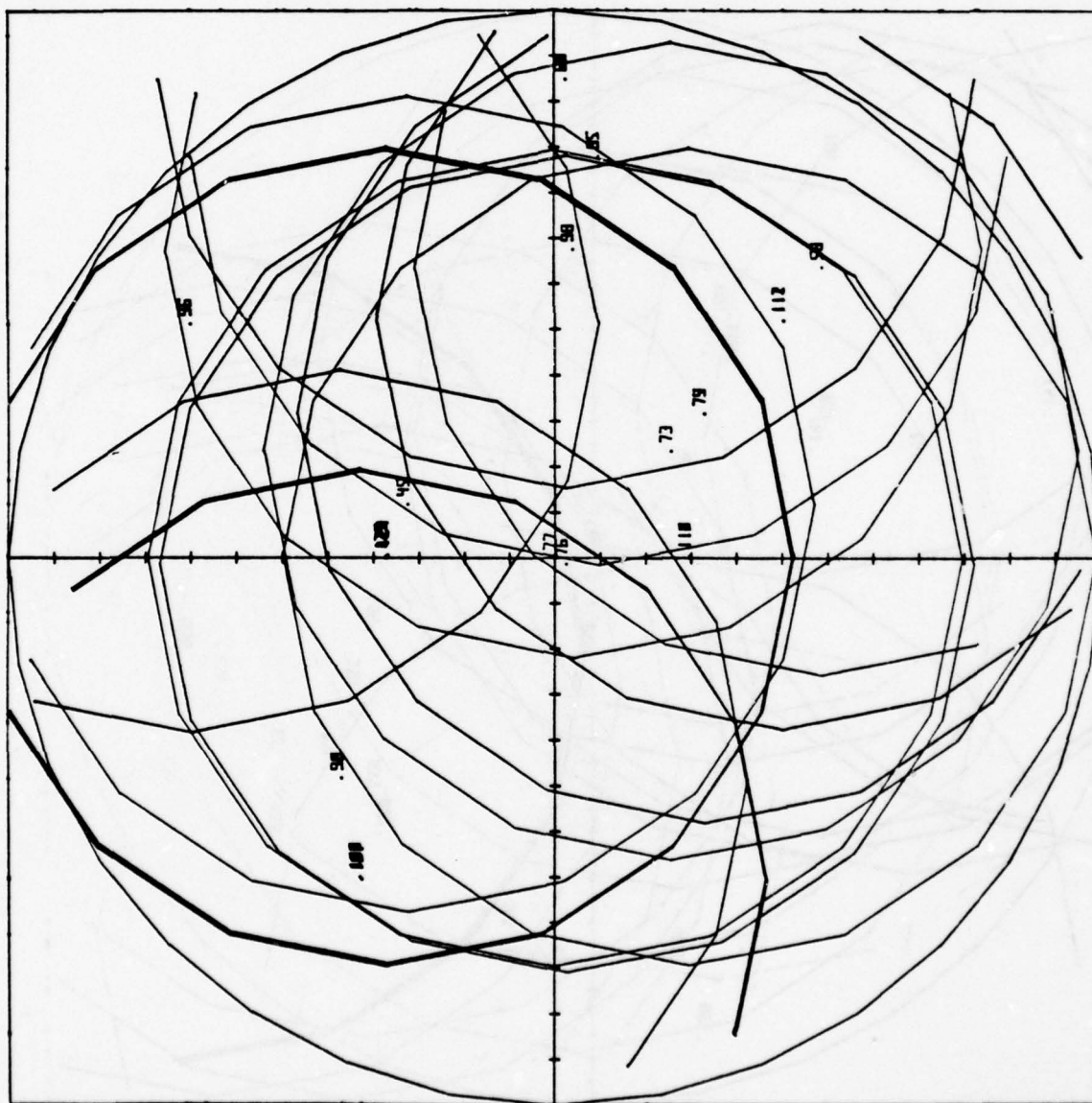


**LOS ANGELES, CALIF.**

DATE 1000 CITE NUMBER 44,221,359  
ALL OF NEW YORK NUMBER 1000

LE # 22 USED AS BATHING SITE

Block	#	45	WTHH	17,500,720
Block <td># 58</td> <td>WTHH</td> <td>42,325,740</td> <td></td>	# 58	WTHH	42,325,740	
Block <td># 59</td> <td>WTHH</td> <td>43,304,730</td> <td></td>	# 59	WTHH	43,304,730	
Block <td># 60</td> <td>WTHH</td> <td>42,404,730</td> <td></td>	# 60	WTHH	42,404,730	
Block <td># 73</td> <td>WTHH</td> <td>17,500,720</td> <td></td>	# 73	WTHH	17,500,720	
Block <td># 74</td> <td>WTHH</td> <td>22,515,715</td> <td></td>	# 74	WTHH	22,515,715	
Block <td># 75</td> <td>WTHH</td> <td>22,515,715</td> <td></td>	# 75	WTHH	22,515,715	
Block <td># 76</td> <td>WTHH</td> <td>1,450,580,51</td> <td></td>	# 76	WTHH	1,450,580,51	
Block <td># 77</td> <td>WTHH</td> <td>0</td> <td>000</td>	# 77	WTHH	0	000
Block <td># 96</td> <td>WTHH</td> <td>52,950,750</td> <td></td>	# 96	WTHH	52,950,750	
Block <td># 95</td> <td>WTHH</td> <td>44,244,761,9</td> <td></td>	# 95	WTHH	44,244,761,9	
Block <td># 96</td> <td>WTHH</td> <td>47,449,756,4</td> <td></td>	# 96	WTHH	47,449,756,4	
Block <td># 93</td> <td>WTHH</td> <td>13,511,741,8</td> <td></td>	# 93	WTHH	13,511,741,8	
Block <td># 100</td> <td>WTHH</td> <td>41,501,760,33</td> <td></td>	# 100	WTHH	41,501,760,33	
Block <td># 101</td> <td>WTHH</td> <td>41,501,760,33</td> <td></td>	# 101	WTHH	41,501,760,33	
Block <td># 110</td> <td>WTHH</td> <td>14,500,750,05</td> <td></td>	# 110	WTHH	14,500,750,05	
Block <td># 111</td> <td>WTHH</td> <td>36,761,741,9</td> <td></td>	# 111	WTHH	36,761,741,9	
Block <td># 112</td> <td>WTHH</td> <td>36,761,741,9</td> <td></td>	# 112	WTHH	36,761,741,9	
Block <td># 123</td> <td>WTHH</td> <td>18,400,760,21</td> <td></td>	# 123	WTHH	18,400,760,21	
Block <td># 124</td> <td>WTHH</td> <td>18,400,760,21</td> <td></td>	# 124	WTHH	18,400,760,21	
Block <td># 125</td> <td>WTHH</td> <td>18,400,760,21</td> <td></td>	# 125	WTHH	18,400,760,21	





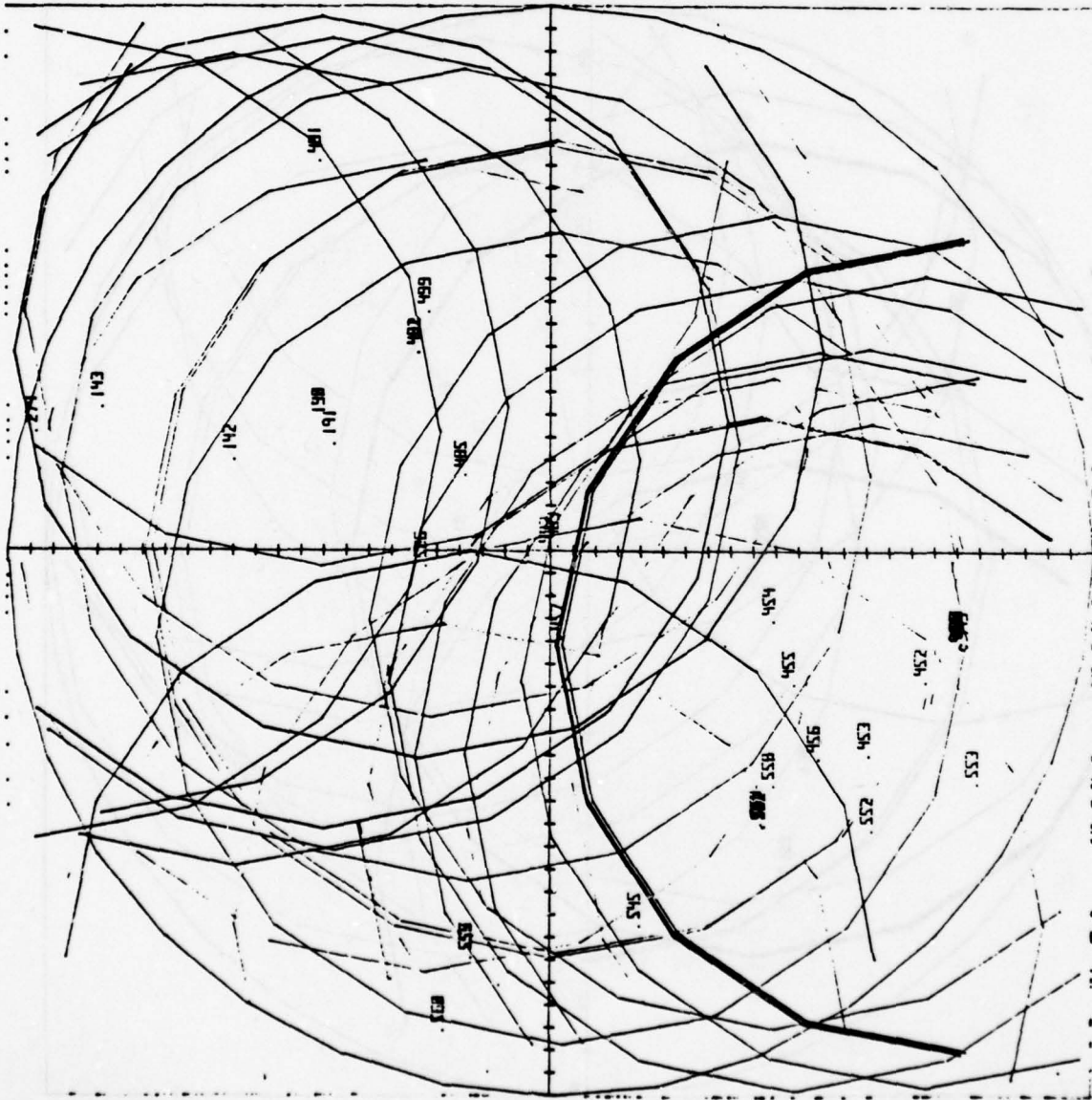
LGA

NEW YORK

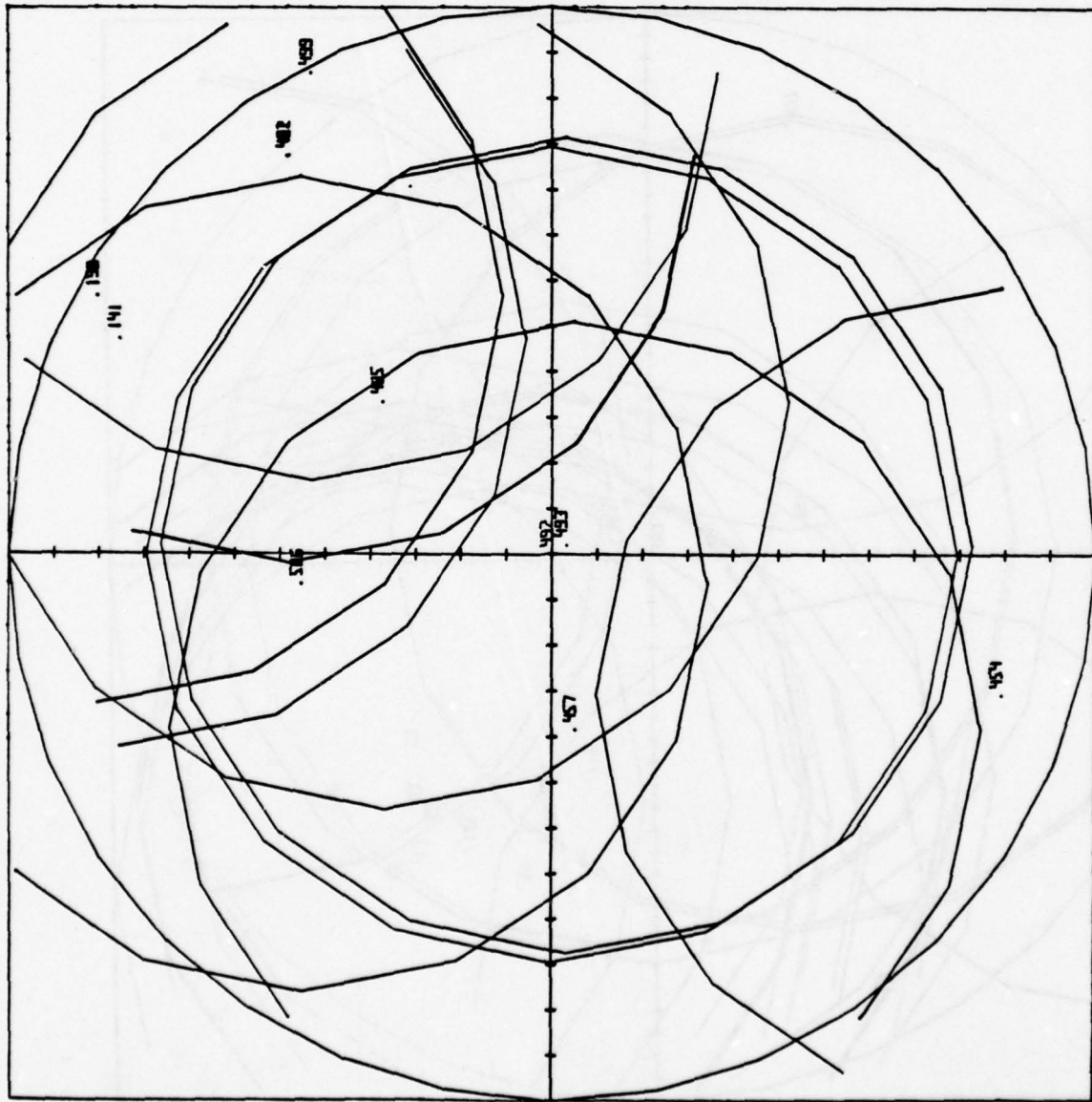
IN LIGHT 4000 GIVES RADIUS 89.442/1910  
51.7 or 1111 RADIUS 100.120

FILE # 492 USED AS ORIGINAL SITE

Radius # 129	011000	51.56110000	00
Radius # 140	011000	51.56110000	00
Radius # 141	011000	51.56110000	00
Radius # 142	011000	51.56110000	00
Radius # 143	011000	51.56110000	00
Radius # 144	011000	51.56110000	00
Radius # 145	011000	51.56110000	00
Radius # 146	011000	51.56110000	00
Radius # 147	011000	51.56110000	00
Radius # 148	011000	51.56110000	00
Radius # 149	011000	51.56110000	00
Radius # 150	011000	51.56110000	00
Radius # 151	011000	51.56110000	00
Radius # 152	011000	51.56110000	00
Radius # 153	011000	51.56110000	00
Radius # 154	011000	51.56110000	00
Radius # 155	011000	51.56110000	00
Radius # 156	011000	51.56110000	00
Radius # 157	011000	51.56110000	00
Radius # 158	011000	51.56110000	00
Radius # 159	011000	51.56110000	00
Radius # 160	011000	51.56110000	00
Radius # 161	011000	51.56110000	00
Radius # 162	011000	51.56110000	00
Radius # 163	011000	51.56110000	00
Radius # 164	011000	51.56110000	00
Radius # 165	011000	51.56110000	00
Radius # 166	011000	51.56110000	00
Radius # 167	011000	51.56110000	00
Radius # 168	011000	51.56110000	00
Radius # 169	011000	51.56110000	00
Radius # 170	011000	51.56110000	00
Radius # 171	011000	51.56110000	00
Radius # 172	011000	51.56110000	00
Radius # 173	011000	51.56110000	00
Radius # 174	011000	51.56110000	00
Radius # 175	011000	51.56110000	00
Radius # 176	011000	51.56110000	00
Radius # 177	011000	51.56110000	00
Radius # 178	011000	51.56110000	00
Radius # 179	011000	51.56110000	00
Radius # 180	011000	51.56110000	00
Radius # 181	011000	51.56110000	00
Radius # 182	011000	51.56110000	00
Radius # 183	011000	51.56110000	00
Radius # 184	011000	51.56110000	00
Radius # 185	011000	51.56110000	00
Radius # 186	011000	51.56110000	00
Radius # 187	011000	51.56110000	00
Radius # 188	011000	51.56110000	00
Radius # 189	011000	51.56110000	00
Radius # 190	011000	51.56110000	00
Radius # 191	011000	51.56110000	00
Radius # 192	011000	51.56110000	00
Radius # 193	011000	51.56110000	00
Radius # 194	011000	51.56110000	00
Radius # 195	011000	51.56110000	00
Radius # 196	011000	51.56110000	00
Radius # 197	011000	51.56110000	00
Radius # 198	011000	51.56110000	00
Radius # 199	011000	51.56110000	00
Radius # 200	011000	51.56110000	00







D-85

LGA

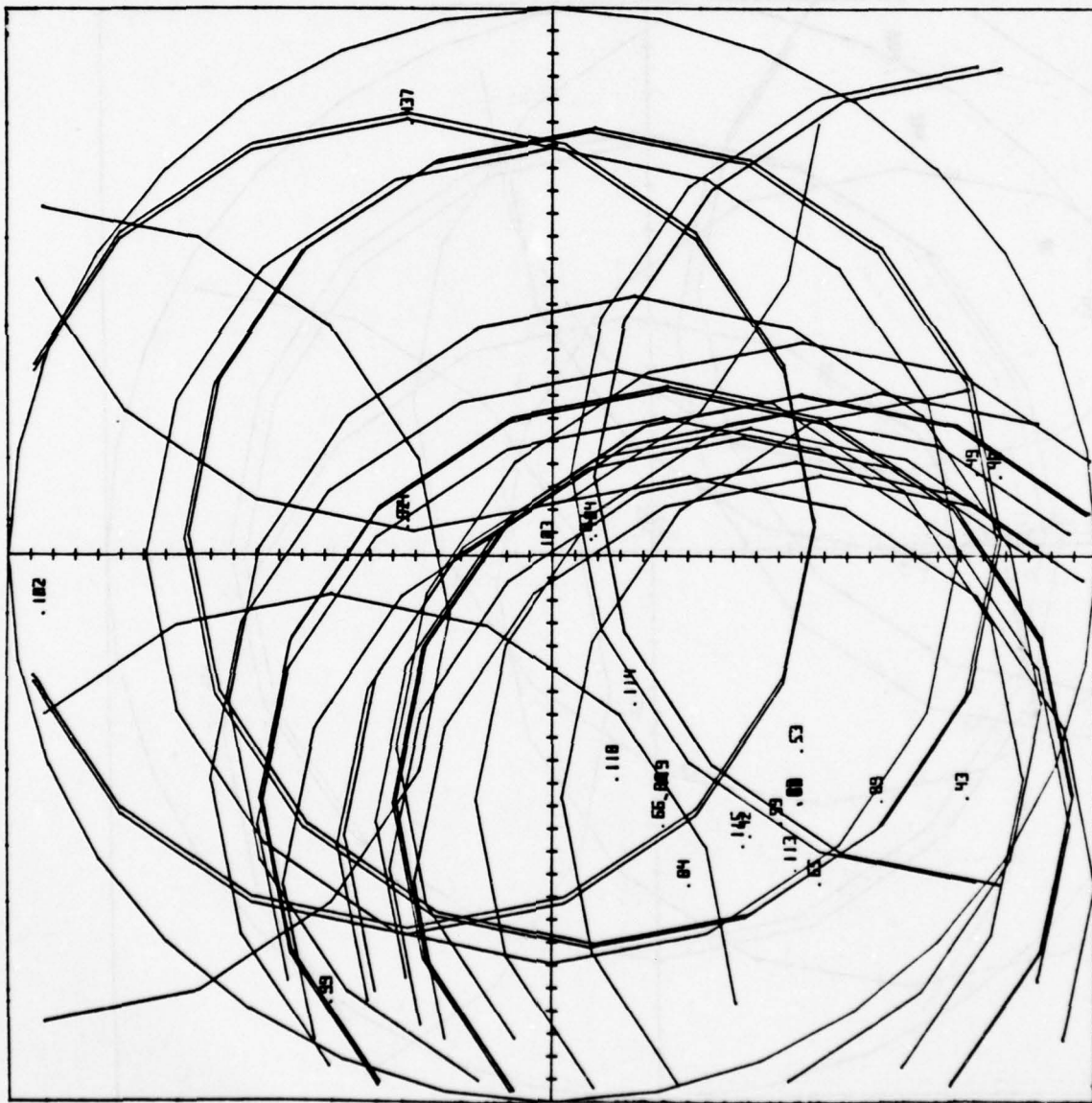
NEW YORK

ALL LIGHT TOWER CIRCLES RADIUS 44.721,5955  
SIZE OF AREA RADIUS 100,000

ALL # 452 USED AS NORTH LINE

Radius # 139	WITHIN 57.56110006
Radius # 140	WITHIN 57.56110006
Radius # 141	WITHIN 57.56110006
Radius # 142	WITHIN 57.56110006
Radius # 143	WITHIN 57.56110006
Radius # 144	WITHIN 57.56110006
Radius # 145	WITHIN 57.56110006
Radius # 146	WITHIN 57.56110006
Radius # 147	WITHIN 57.56110006
Radius # 148	WITHIN 57.56110006
Radius # 149	WITHIN 57.56110006
Radius # 150	WITHIN 57.56110006
Radius # 151	WITHIN 57.56110006
Radius # 152	WITHIN 57.56110006
Radius # 153	WITHIN 57.56110006
Radius # 154	WITHIN 57.56110006
Radius # 155	WITHIN 57.56110006
Radius # 156	WITHIN 57.56110006
Radius # 157	WITHIN 57.56110006
Radius # 158	WITHIN 57.56110006
Radius # 159	WITHIN 57.56110006
Radius # 160	WITHIN 57.56110006





D-86

MCC

SACRAMENTO, CALIF.  
MCCELLAN/BEALE

IN 1000 4000 GIVE'S RADIOS 89.4427191  
SIZE OF AREA RADIOS 1000 120

FILE # 103 USED AS INITIAL SITE

FRONT # 42	WITHIN 75.29761136	HP
FRONT # 43	WITHIN 105.7502725	HP
FRONT # 44	WITHIN 32.59914897	HP
FRONT # 47	WITHIN 100.0718594	HP
FRONT # 48	WITHIN 100.1227675	HP
FRONT # 49	WITHIN 95.10030693	HP
FRONT # 53	WITHIN 65.54620395	HP
FRONT # 55	WITHIN 92.92209904	HP
FRONT # 56	WITHIN 64.02337050	HP
FRONT # 57	WITHIN 76.64811113	HP
FRONT # 58	WITHIN 77.01349366	HP
FRONT # 59	WITHIN 77.01349366	HP
FRONT # 60	WITHIN 58.65021865	HP
FRONT # 81	WITHIN 58.65021865	HP
FRONT # 82	WITHIN 32.27615467	HP
FRONT # 83	WITHIN 9.223342949	HP
FRONT # 84	WITHIN 28.17436072	HP
FRONT # 89	WITHIN 90.25355658	HP
FRONT # 93	WITHIN 77.07827822	HP
FRONT # 94	WITHIN 77.07827822	HP
FRONT # 99	WITHIN 109.2630099	HP
FRONT # 102	WITHIN 112.7074013	HP
FRONT # 103	WITHIN 0	HP
FRONT # 104	WITHIN 10.4183025	HP
FRONT # 113	WITHIN 67.1991090	HP
FRONT # 114	WITHIN 37.7076297	HP
FRONT # 115	WITHIN 76.18418579	HP
FRONT # 116	WITHIN 50.9643539	HP
FRONT # 117	WITHIN 50.9643539	HP
FRONT # 118	WITHIN 50.9643539	HP
FRONT # 119	WITHIN 50.9643539	HP
FRONT # 120	WITHIN 50.9643539	HP
FRONT # 121	WITHIN 50.9643539	HP
FRONT # 122	WITHIN 50.9643539	HP
FRONT # 123	WITHIN 50.9643539	HP
FRONT # 124	WITHIN 50.9643539	HP
FRONT # 125	WITHIN 50.9643539	HP
FRONT # 126	WITHIN 50.9643539	HP
FRONT # 127	WITHIN 50.9643539	HP
FRONT # 128	WITHIN 50.9643539	HP
FRONT # 129	WITHIN 50.9643539	HP
FRONT # 130	WITHIN 50.9643539	HP
FRONT # 131	WITHIN 50.9643539	HP
FRONT # 132	WITHIN 50.9643539	HP
FRONT # 133	WITHIN 50.9643539	HP
FRONT # 134	WITHIN 50.9643539	HP
FRONT # 135	WITHIN 50.9643539	HP
FRONT # 136	WITHIN 50.9643539	HP
FRONT # 137	WITHIN 50.9643539	HP
FRONT # 138	WITHIN 50.9643539	HP
FRONT # 139	WITHIN 50.9643539	HP
FRONT # 140	WITHIN 50.9643539	HP
FRONT # 141	WITHIN 50.9643539	HP
FRONT # 142	WITHIN 50.9643539	HP
FRONT # 143	WITHIN 50.9643539	HP
FRONT # 144	WITHIN 50.9643539	HP
FRONT # 145	WITHIN 50.9643539	HP
FRONT # 146	WITHIN 50.9643539	HP
FRONT # 147	WITHIN 50.9643539	HP
FRONT # 148	WITHIN 50.9643539	HP
FRONT # 149	WITHIN 50.9643539	HP
FRONT # 150	WITHIN 50.9643539	HP
FRONT # 151	WITHIN 50.9643539	HP
FRONT # 152	WITHIN 50.9643539	HP
FRONT # 153	WITHIN 50.9643539	HP
FRONT # 154	WITHIN 50.9643539	HP
FRONT # 155	WITHIN 50.9643539	HP
FRONT # 156	WITHIN 50.9643539	HP
FRONT # 157	WITHIN 50.9643539	HP
FRONT # 158	WITHIN 50.9643539	HP
FRONT # 159	WITHIN 50.9643539	HP
FRONT # 160	WITHIN 50.9643539	HP
FRONT # 161	WITHIN 50.9643539	HP
FRONT # 162	WITHIN 50.9643539	HP
FRONT # 163	WITHIN 50.9643539	HP
FRONT # 164	WITHIN 50.9643539	HP
FRONT # 165	WITHIN 50.9643539	HP
FRONT # 166	WITHIN 50.9643539	HP
FRONT # 167	WITHIN 50.9643539	HP
FRONT # 168	WITHIN 50.9643539	HP
FRONT # 169	WITHIN 50.9643539	HP
FRONT # 170	WITHIN 50.9643539	HP
FRONT # 171	WITHIN 50.9643539	HP
FRONT # 172	WITHIN 50.9643539	HP
FRONT # 173	WITHIN 50.9643539	HP
FRONT # 174	WITHIN 50.9643539	HP
FRONT # 175	WITHIN 50.9643539	HP
FRONT # 176	WITHIN 50.9643539	HP
FRONT # 177	WITHIN 50.9643539	HP
FRONT # 178	WITHIN 50.9643539	HP
FRONT # 179	WITHIN 50.9643539	HP
FRONT # 180	WITHIN 50.9643539	HP
FRONT # 181	WITHIN 50.9643539	HP
FRONT # 182	WITHIN 50.9643539	HP
FRONT # 183	WITHIN 50.9643539	HP
FRONT # 184	WITHIN 50.9643539	HP
FRONT # 185	WITHIN 50.9643539	HP
FRONT # 186	WITHIN 50.9643539	HP
FRONT # 187	WITHIN 50.9643539	HP
FRONT # 188	WITHIN 50.9643539	HP
FRONT # 189	WITHIN 50.9643539	HP
FRONT # 190	WITHIN 50.9643539	HP
FRONT # 191	WITHIN 50.9643539	HP
FRONT # 192	WITHIN 50.9643539	HP
FRONT # 193	WITHIN 50.9643539	HP
FRONT # 194	WITHIN 50.9643539	HP
FRONT # 195	WITHIN 50.9643539	HP
FRONT # 196	WITHIN 50.9643539	HP
FRONT # 197	WITHIN 50.9643539	HP
FRONT # 198	WITHIN 50.9643539	HP
FRONT # 199	WITHIN 50.9643539	HP
FRONT # 200	WITHIN 50.9643539	HP



MCC

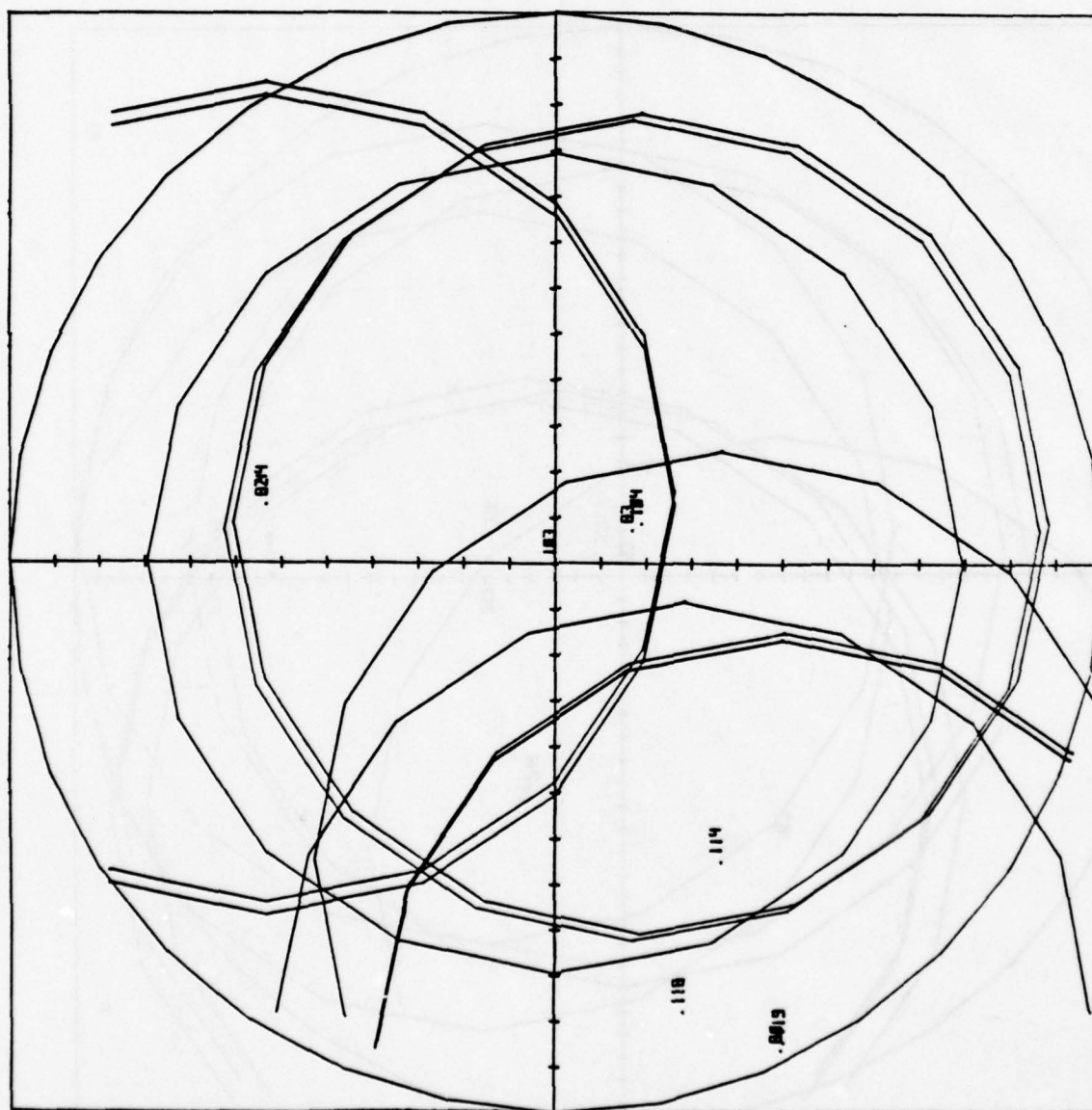
SACRAMENTO, CALIF.  
MCCELLANNE

HEIGHT 1000 GIVES PHOTOS 44.72135  
DATE OF AREA PHOTOS 11/11/60

FILE # 103 USED AS HORIZONTAL SITE

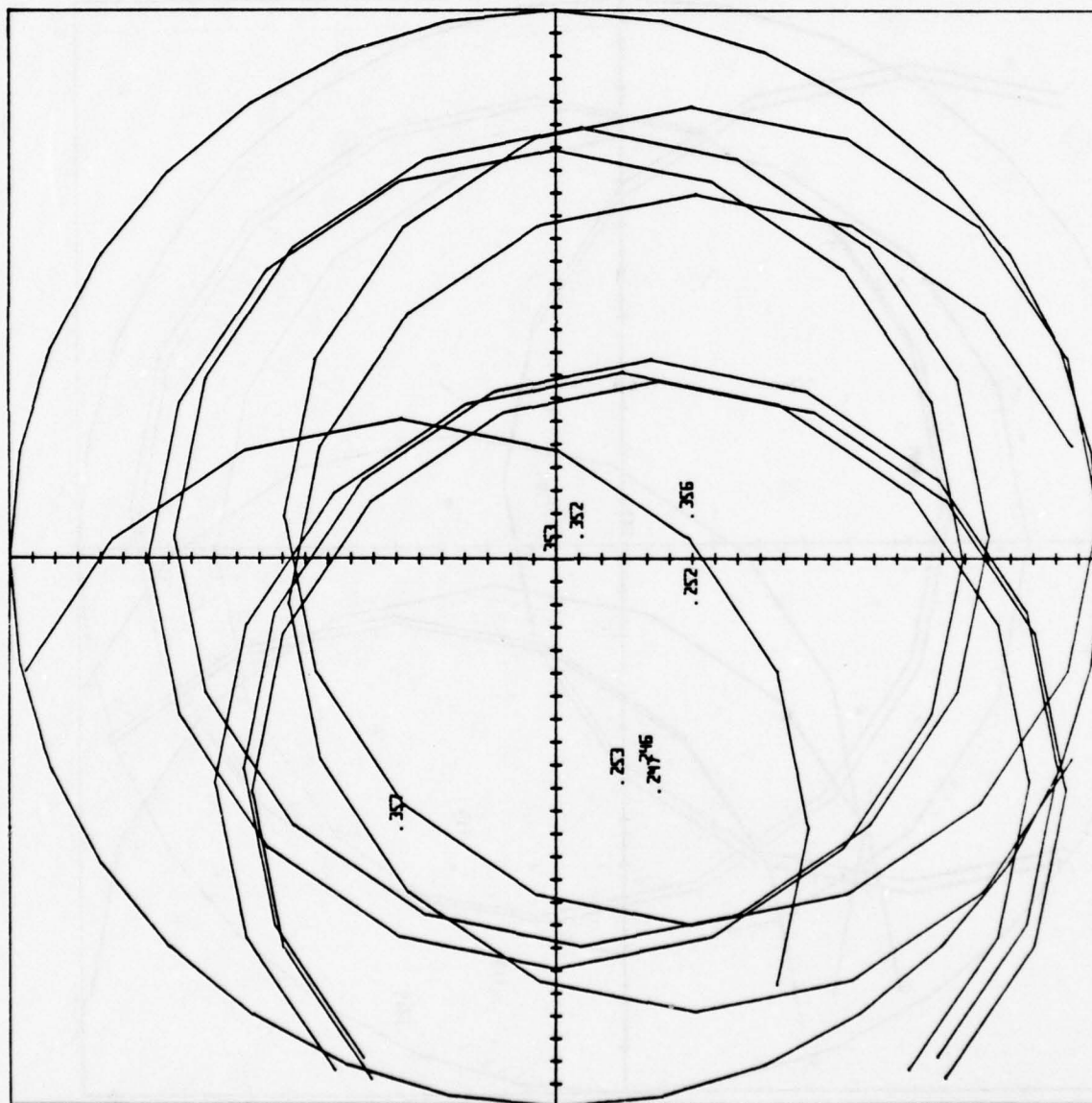
PHOTO # 44	WITHIN 32.54914897
PHOTO # 80	WITHIN 58.65021865
PHOTO # 81	WITHIN 58.65021865
PHOTO # 82	WITHIN 31.27615467
PHOTO # 83	WITHIN 9.222392949
PHOTO # 103	WITHIN 0 NM
PHOTO # 104	WITHIN 10.4183025
PHOTO # 114	WITHIN 37.27076297
PHOTO # 118	WITHIN 50.98423539
PHOTO # 119	WITHIN 58.0387599

\*\*\* \*\*\*\*\* \*\*\*\*\*





**KANSAS CITY INTL.**

[illegible]



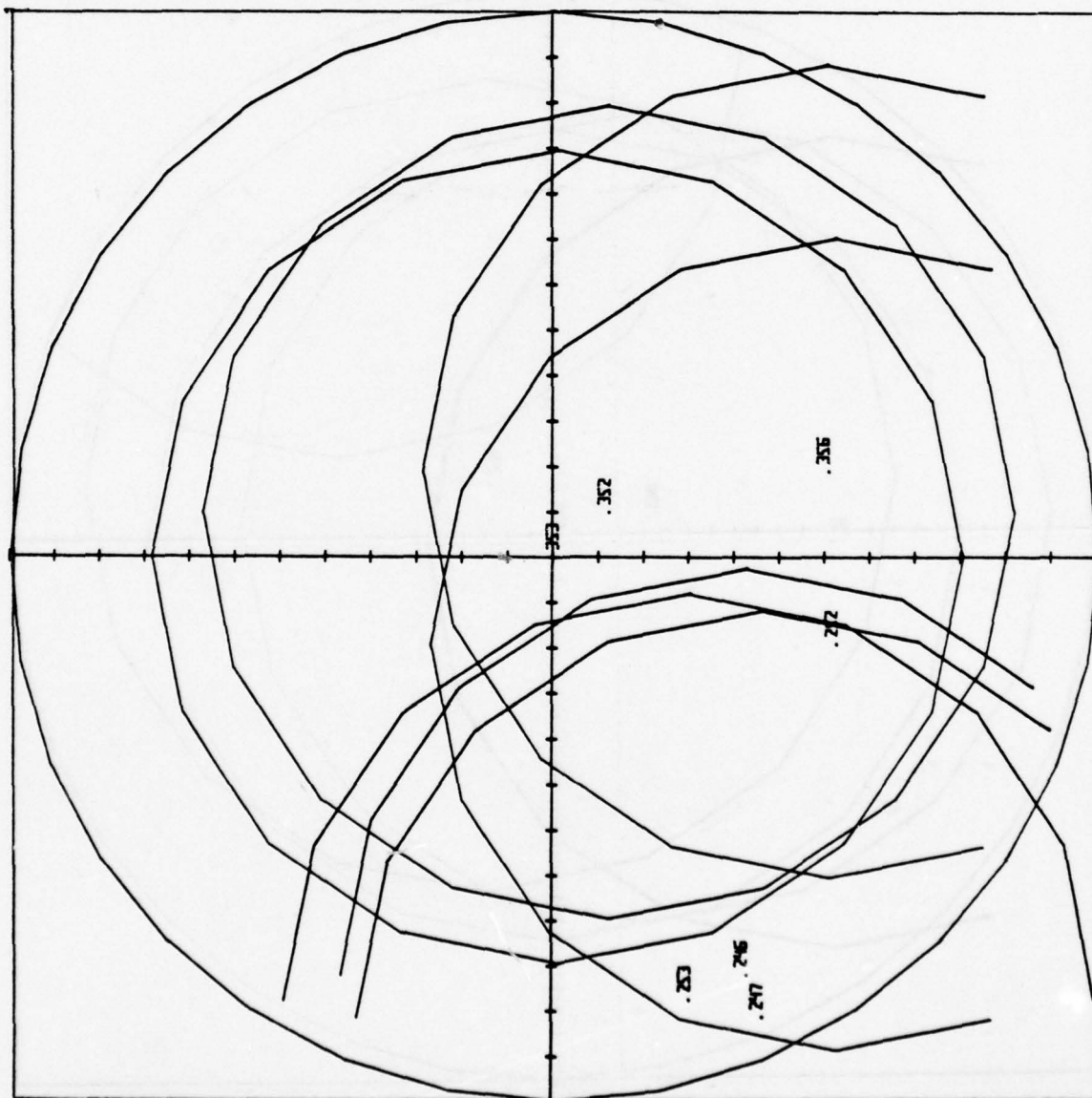
MCI

KANSAS CITY INTL.

LIGHT 1000 GIVES RADIUS 44.72135  
 I.E. OF HELIX RADIUS 1000 60

FILE # 353 USED AS INITIAL SITE

GROUP # 246 WITHIN 50.5476 3005 1  
 GROUP # 247 WITHIN 50.5405 3020 1  
 GROUP # 252 WITHIN 50.5405 3020 1  
 GROUP # 253 WITHIN 50.5405 3020 1  
 GROUP # 353 WITHIN 50.5405 3020 1  
 GROUP # 354 WITHIN 50.5405 3020 1  
 GROUP # 355 WITHIN 50.5405 3020 1  
 GROUP # 356 WITHIN 50.5405 3020 1  
 .... \*\*\*\*\*





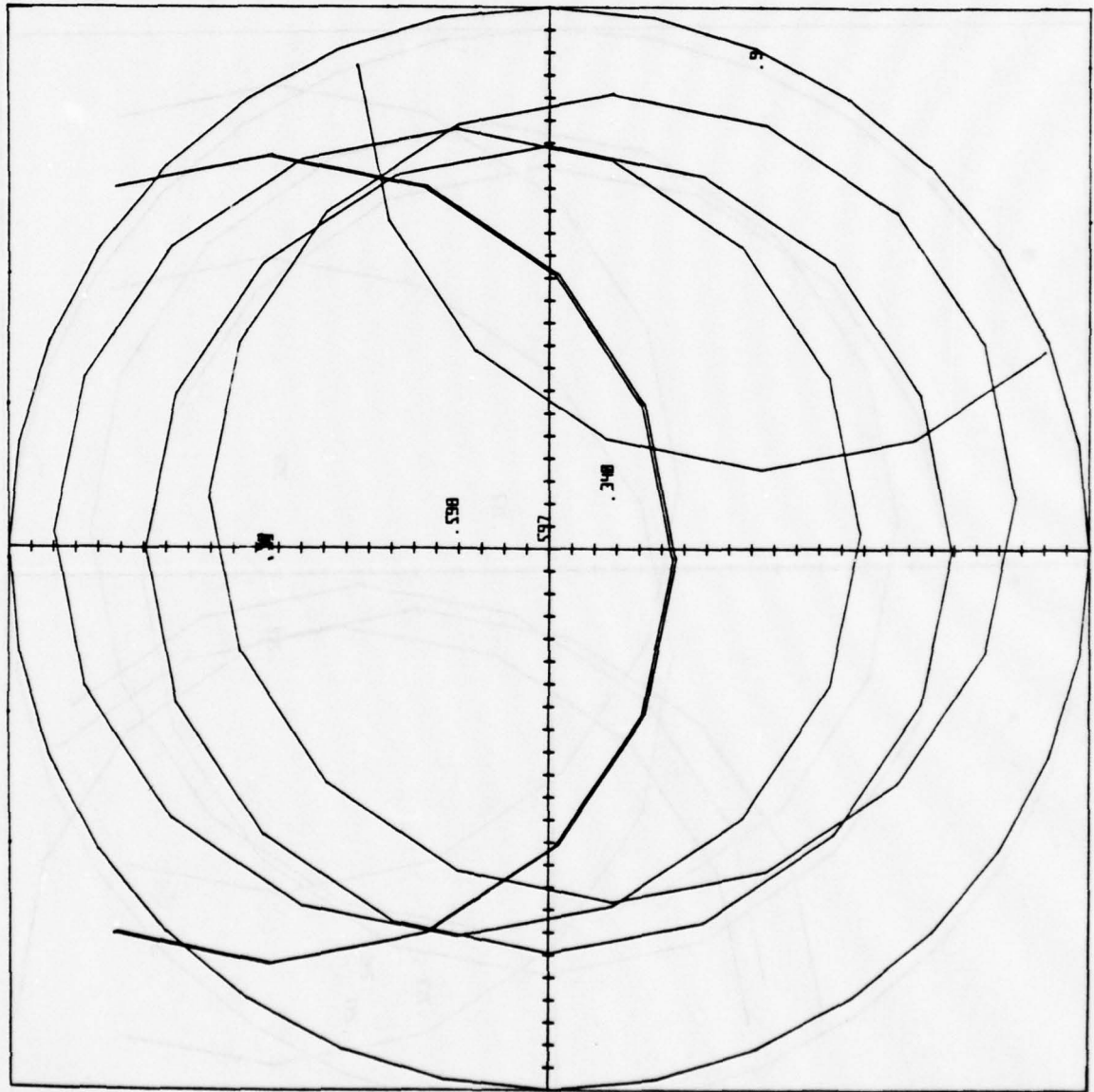
MEM

MEMPHIS, TENN.

1000 4000 6190 10000 87.442713  
 1.1 of MEM PROLOG 0000 120

LE # 507 USED TO DETERMINE SITE

PROLOG # 1 WITHIN 16.8562196 N  
 PROLOG # 25 WITHIN 61.3731372 N  
 PROLOG # 26 WITHIN 65.10011450 N  
 PROLOG # 340 WITHIN 13.98168345 N  
 PROLOG # 507 WITHIN 0 N  
 PROLOG # 508 WITHIN 20.68652492 N

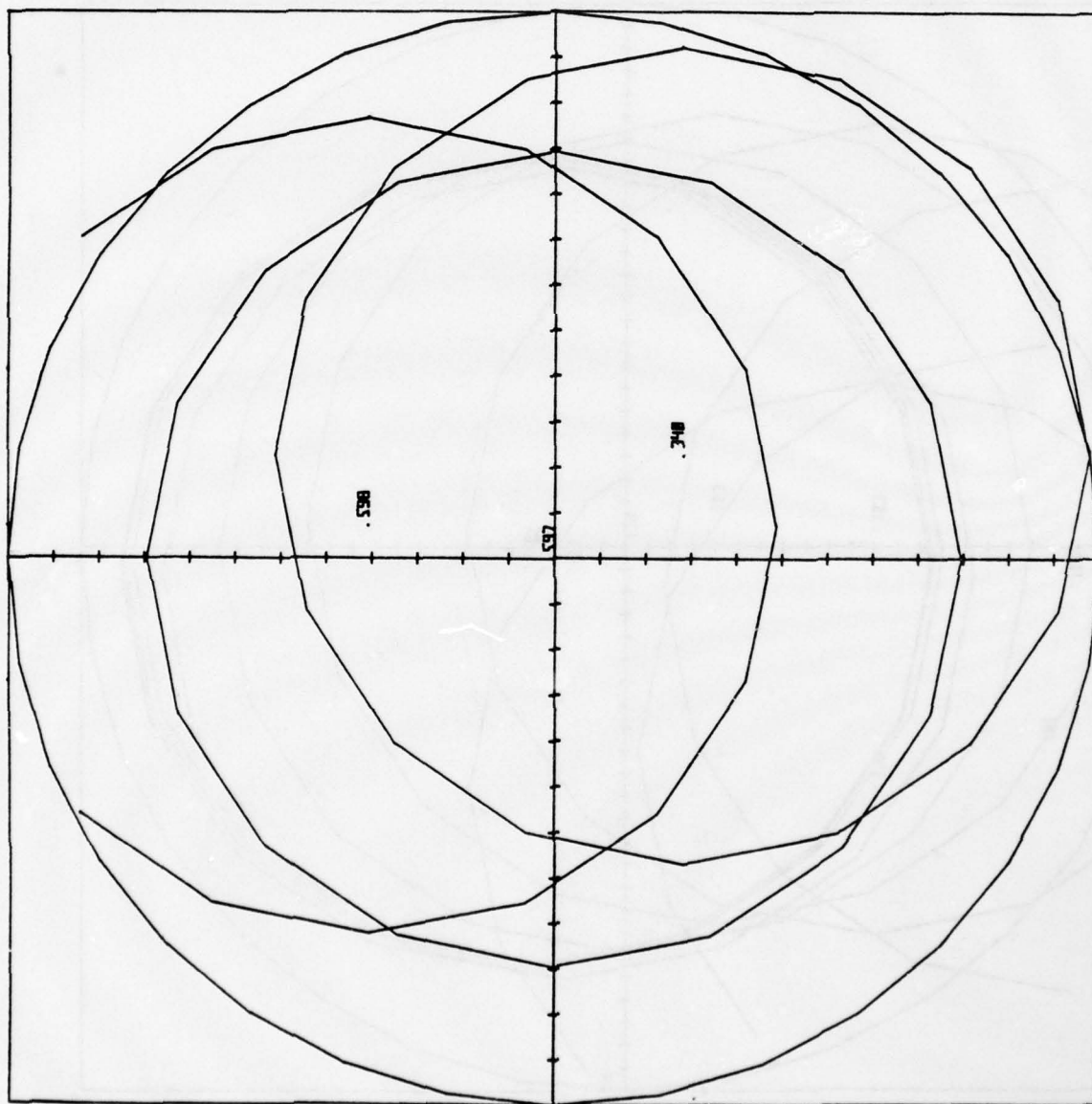




MEM

MEMPHIS, TENN.

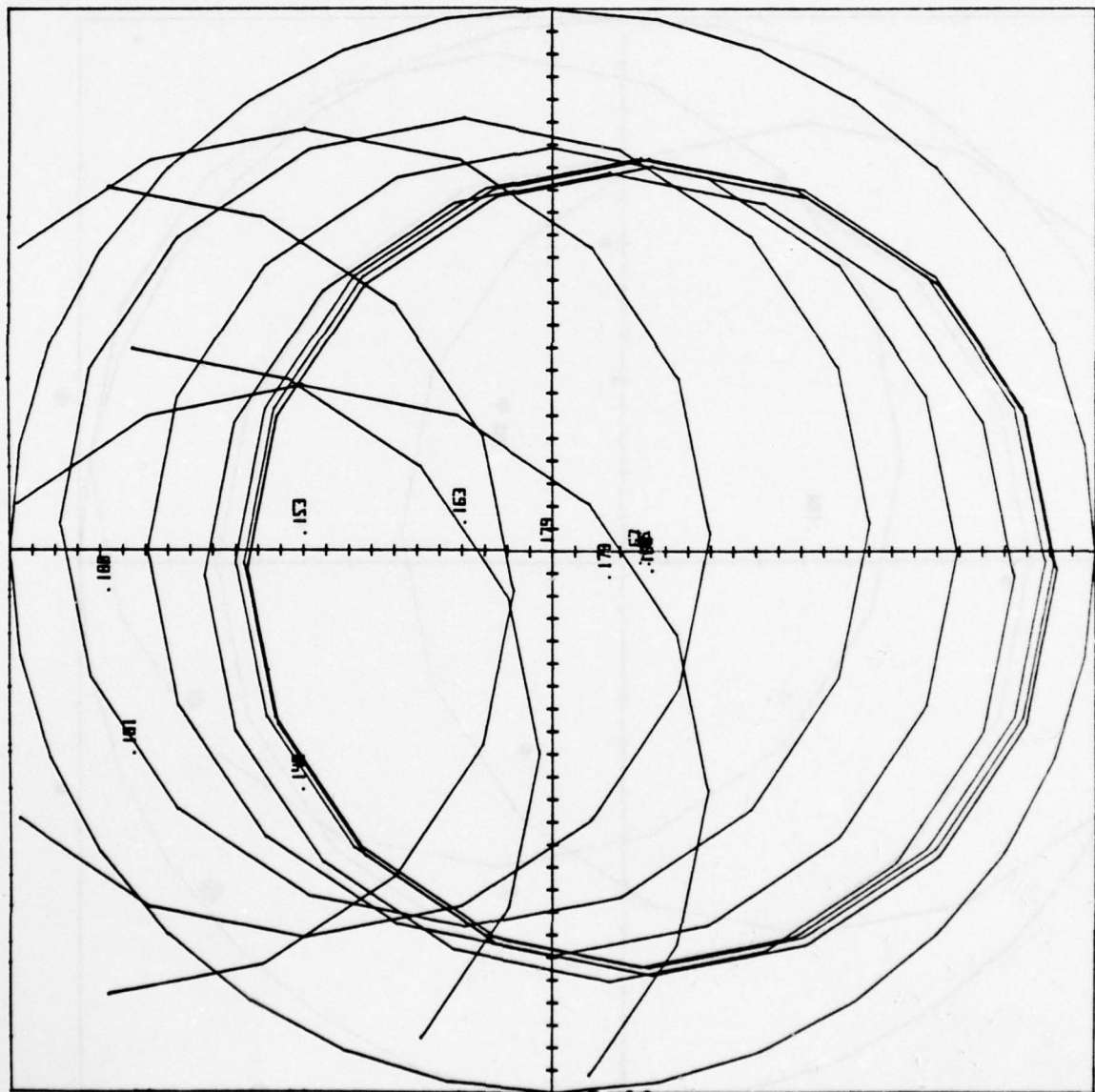
DATE 1000 0130S PHOTOS 44.72125  
LE OF MEM PHOTOS 0000 00  
LE # 597 USED AS BOTTOM SITE  
SOUND # 597 WITHIN 18.0018845  
SOUND # 597 WITHIN 0 00  
SOUND # 597 WITHIN 20.0865242  
\*\*\* \*\*\*\*\*





MIA

MIAMI, FLORIDA



1000 4000 61000 RADIUS 87.442.1  
 ZE OF WHEA PHOTOC 1000 120

LE # 179 USED AS NORTH SITE

PHOTO # 143	WITHIN 76.271.102
PHOTO # 153	WITHIN 54.787.4033
PHOTO # 163	WITHIN 50.500.6723
PHOTO # 164	WITHIN 52.411.5262
PHOTO # 165	WITHIN 51.50.30055
PHOTO # 166	WITHIN 52.411.5262
PHOTO # 167	WITHIN 54.615.3025
PHOTO # 173	WITHIN 13.842.7193
PHOTO # 174	WITHIN 0
PHOTO # 180	WITHIN 48.446.0010
PHOTO # 181	WITHIN 100.55.36796
...	.....



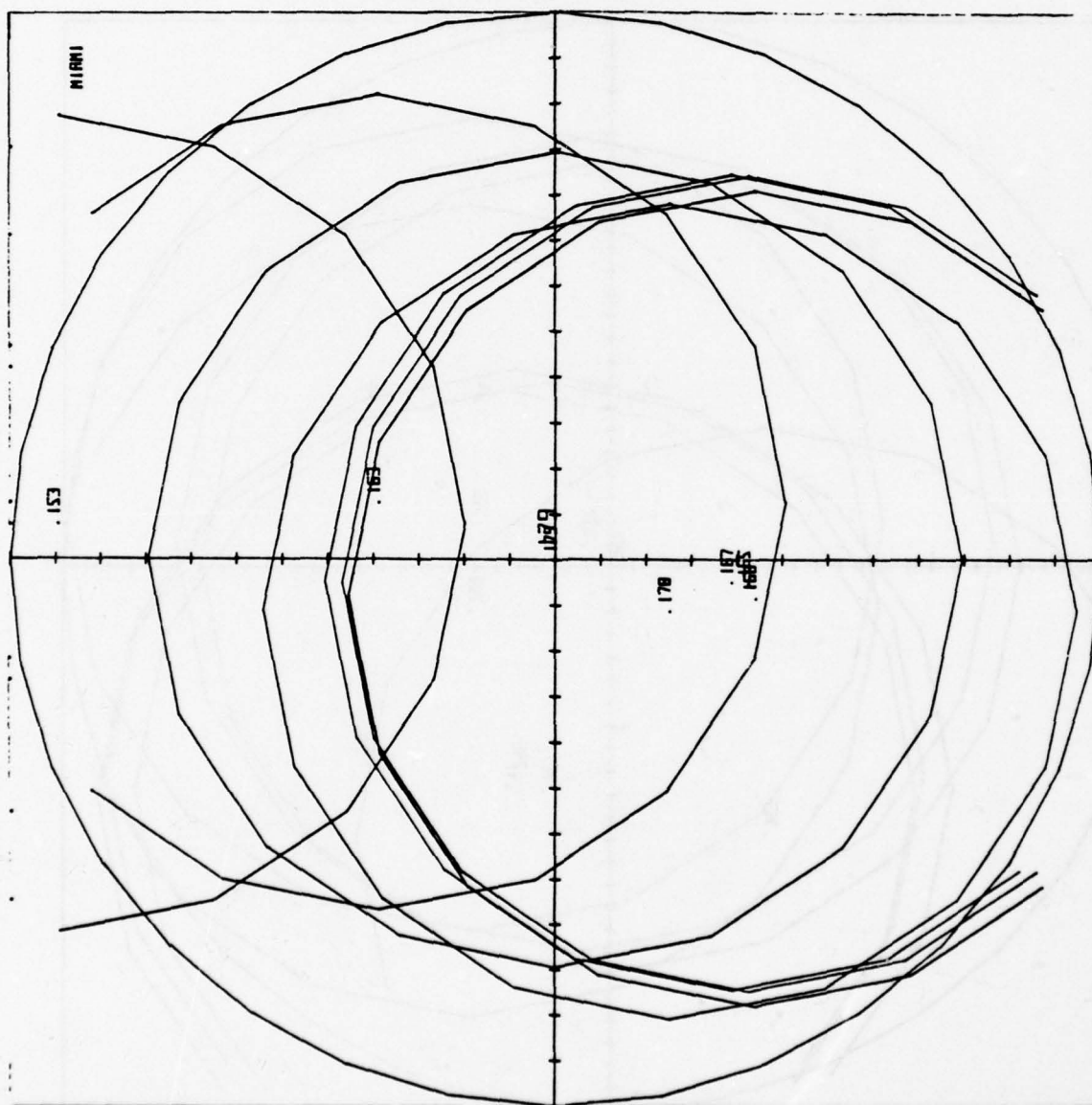
**MIA**

MIAMI, FLORIDA

THE JOURNAL OF OPEN RADIOS (JOUR) 60 72135955

FILE # 179 USED AS NORMAL SIZE

Rank	#	15	16	17	18
Female	15	01000	54,789,403	00	00
Female	16	01000	53,736,623	00	00
Female	17	01000	52,411,267	00	00
Female	18	01000	51,593,005	00	00
Female	19	01000	50,411,522	00	00
Female	20	01000	49,411,572	00	00
Female	21	01000	48,847,193	00	00
Female	22	01000	48,847,193	00	00
Female	23	01000	48,847,193	00	00
Female	24	01000	48,847,193	00	00
Female	25	01000	48,847,193	00	00
Female	26	01000	48,847,193	00	00
Female	27	01000	48,847,193	00	00
Female	28	01000	48,847,193	00	00
Female	29	01000	48,847,193	00	00
Female	30	01000	48,847,193	00	00
Female	31	01000	48,847,193	00	00
Female	32	01000	48,847,193	00	00
Female	33	01000	48,847,193	00	00
Female	34	01000	48,847,193	00	00
Female	35	01000	48,847,193	00	00
Female	36	01000	48,847,193	00	00
Female	37	01000	48,847,193	00	00
Female	38	01000	48,847,193	00	00
Female	39	01000	48,847,193	00	00
Female	40	01000	48,847,193	00	00
Female	41	01000	48,847,193	00	00
Female	42	01000	48,847,193	00	00
Female	43	01000	48,847,193	00	00
Female	44	01000	48,847,193	00	00
Female	45	01000	48,847,193	00	00
Female	46	01000	48,847,193	00	00
Female	47	01000	48,847,193	00	00
Female	48	01000	48,847,193	00	00
Female	49	01000	48,847,193	00	00
Female	50	01000	48,847,193	00	00
Female	51	01000	48,847,193	00	00
Female	52	01000	48,847,193	00	00
Female	53	01000	48,847,193	00	00
Female	54	01000	48,847,193	00	00
Female	55	01000	48,847,193	00	00
Female	56	01000	48,847,193	00	00
Female	57	01000	48,847,193	00	00
Female	58	01000	48,847,193	00	00
Female	59	01000	48,847,193	00	00
Female	60	01000	48,847,193	00	00
Female	61	01000	48,847,193	00	00
Female	62	01000	48,847,193	00	00
Female	63	01000	48,847,193	00	00
Female	64	01000	48,847,193	00	00
Female	65	01000	48,847,193	00	00
Female	66	01000	48,847,193	00	00
Female	67	01000	48,847,193	00	00
Female	68	01000	48,847,193	00	00
Female	69	01000	48,847,193	00	00
Female	70	01000	48,847,193	00	00
Female	71	01000	48,847,193	00	00
Female	72	01000	48,847,193	00	00
Female	73	01000	48,847,193	00	00
Female	74	01000	48,847,193	00	00
Female	75	01000	48,847,193	00	00
Female	76	01000	48,847,193	00	00



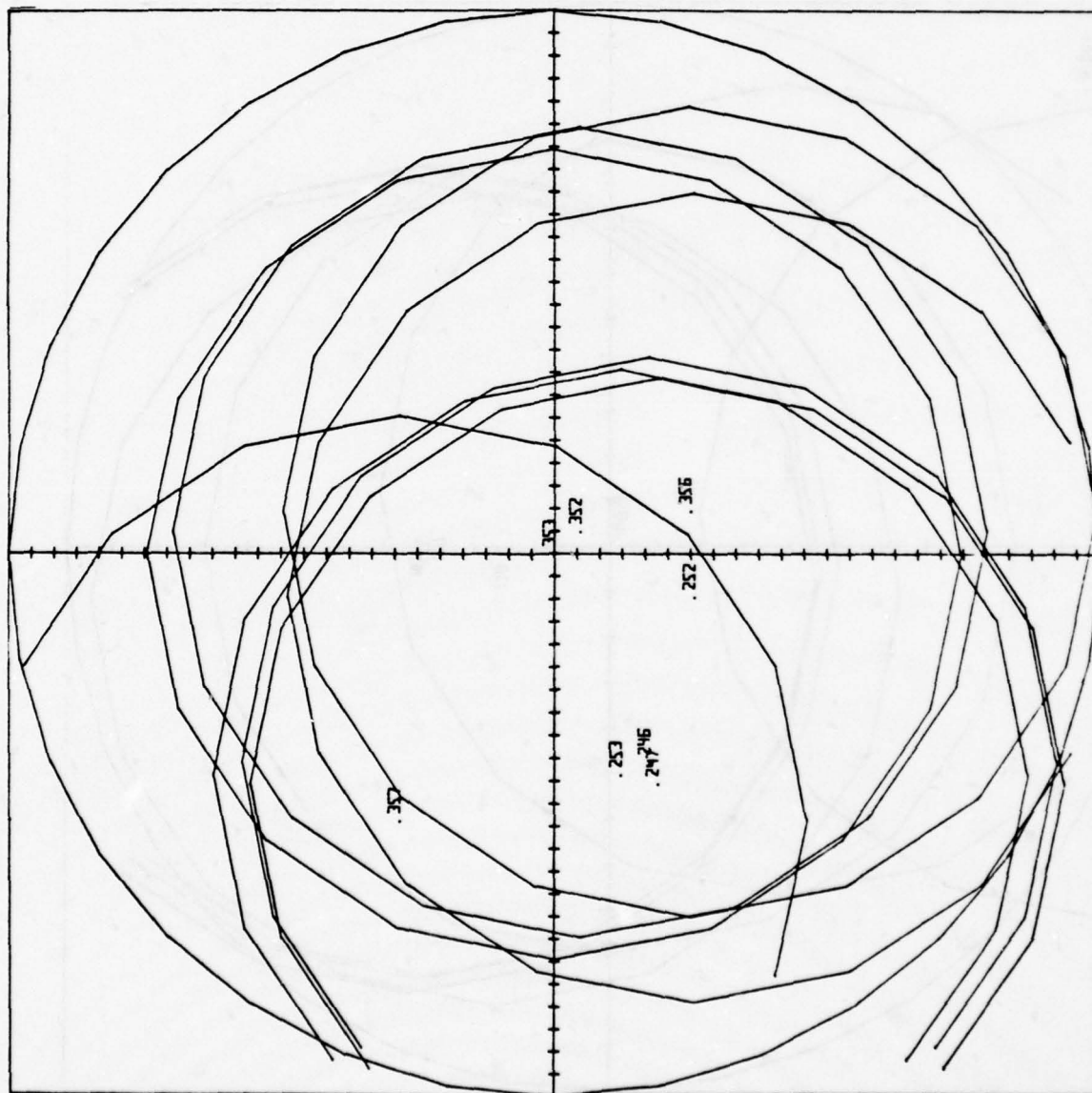


M K C  
KANSAS CITY, MO

Cont. 4000 5.195 60000 89.44271  
1 of 0000 60000 100 100

Set # 250 0000 00 000000 SITE

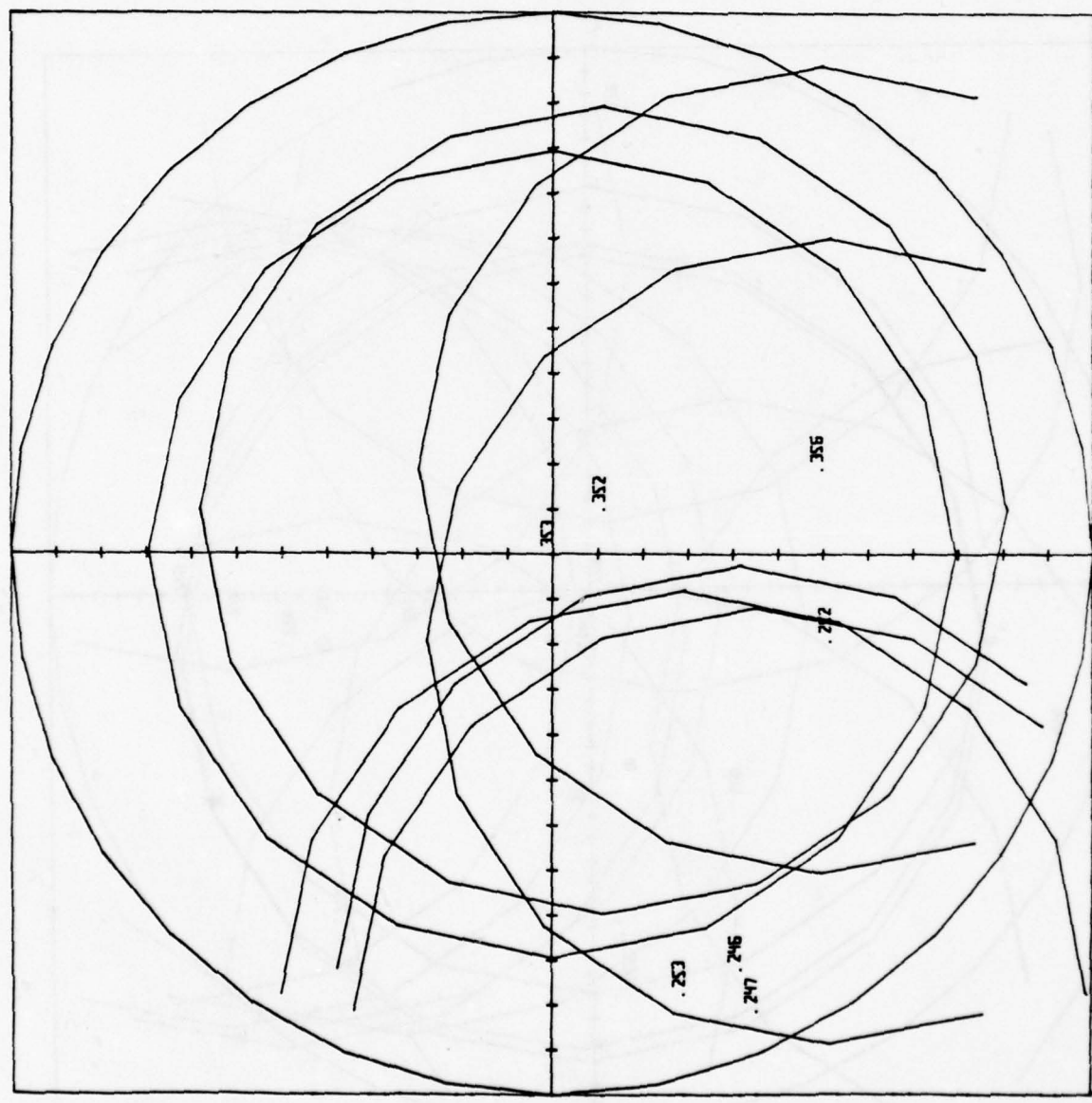
Frame # 246	000000 50.50176005
Frame # 247	000000 50.5051200
Frame # 248	000000 50.5084800
Frame # 249	000000 50.5118400
Frame # 250	000000 50.5152000
Frame # 251	000000 50.5185600
Frame # 252	000000 50.5219200
Frame # 253	000000 50.5252800
Frame # 254	000000 50.5286400
Frame # 255	000000 50.5320000
Frame # 256	000000 50.5353600
Frame # 257	000000 50.5387200
Frame # 258	000000 50.5420800
Frame # 259	000000 50.5454400
Frame # 260	000000 50.5488000





M K C  
KANSAS CITY, MO

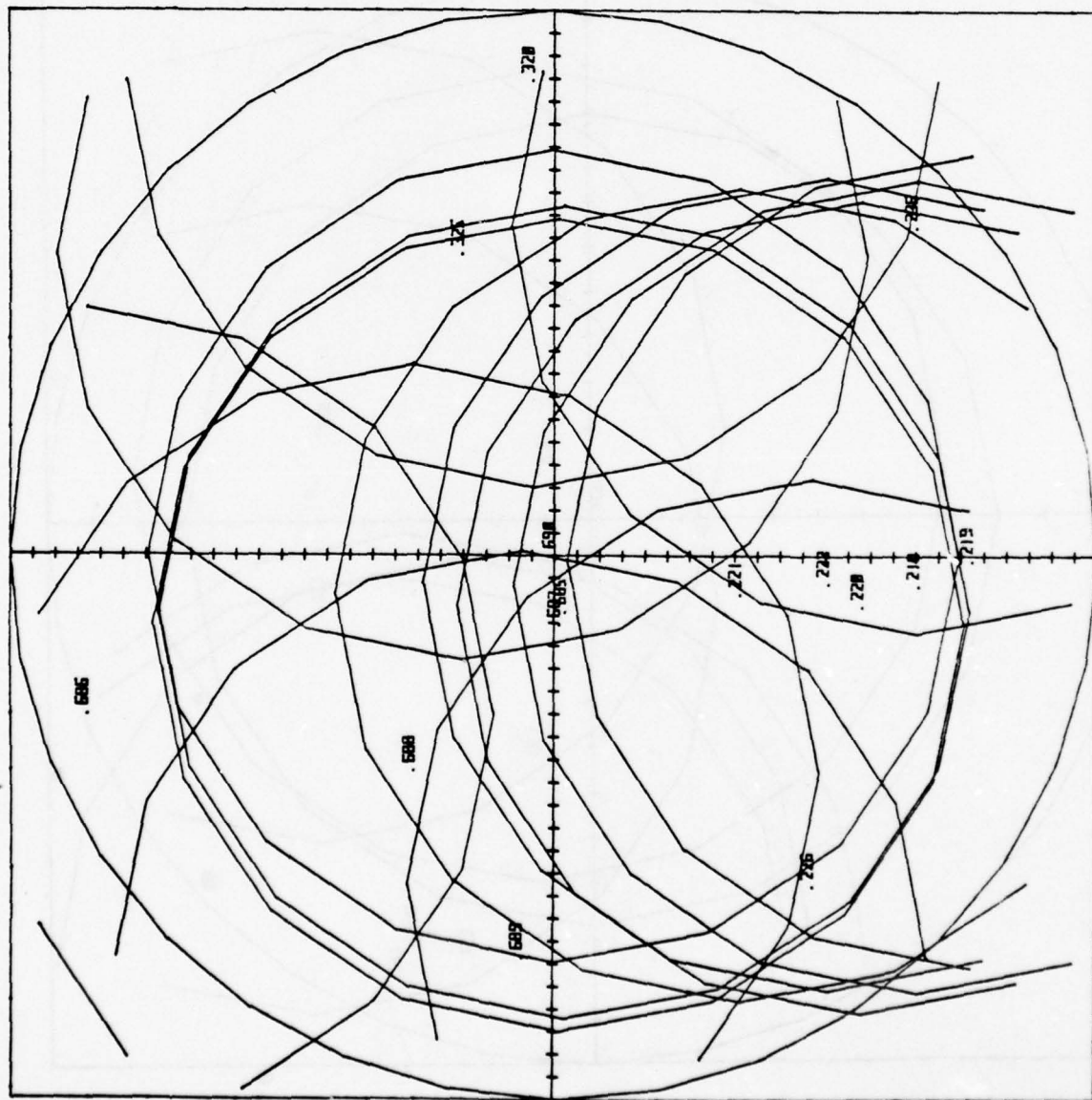
DATE: 1968  
 NAME: M. K. C.  
 FILE # 353 USED AS DOMINANT SITE  
 ELEVATION # 245 50.5472-0005  
 ELEVATION # 247 50.5472-0005  
 ELEVATION # 252 50.5472-0005  
 ELEVATION # 253 50.5472-0005  
 ELEVATION # 254 50.5472-0005  
 ELEVATION # 255 50.5472-0005  
 ELEVATION # 256 50.5472-0005





MKE

MILWAUKEE, WIS.



D-96

TO 1001 4000 6170 100100 05.442719  
 LE OF DELTA 60000 0000 120

LE # 600 USED AS HORIZONTAL SITE

POINT # 010	010000 80.7402502
POINT # 011	010000 72.7471276
POINT # 012	010000 65.0567464
POINT # 013	010000 42.0331604
POINT # 014	010000 60.9100207
POINT # 015	010000 52.3051125
POINT # 016	010000 107.0013000
POINT # 017	010000 67.2097044
POINT # 018	010000 109.5890311
POINT # 019	010000 15.8530438
POINT # 020	010000 109.5001574
POINT # 021	010000 15.3104433
POINT # 022	010000 56.5752059
POINT # 023	010000 68.5634384
POINT # 024	010000 0 100



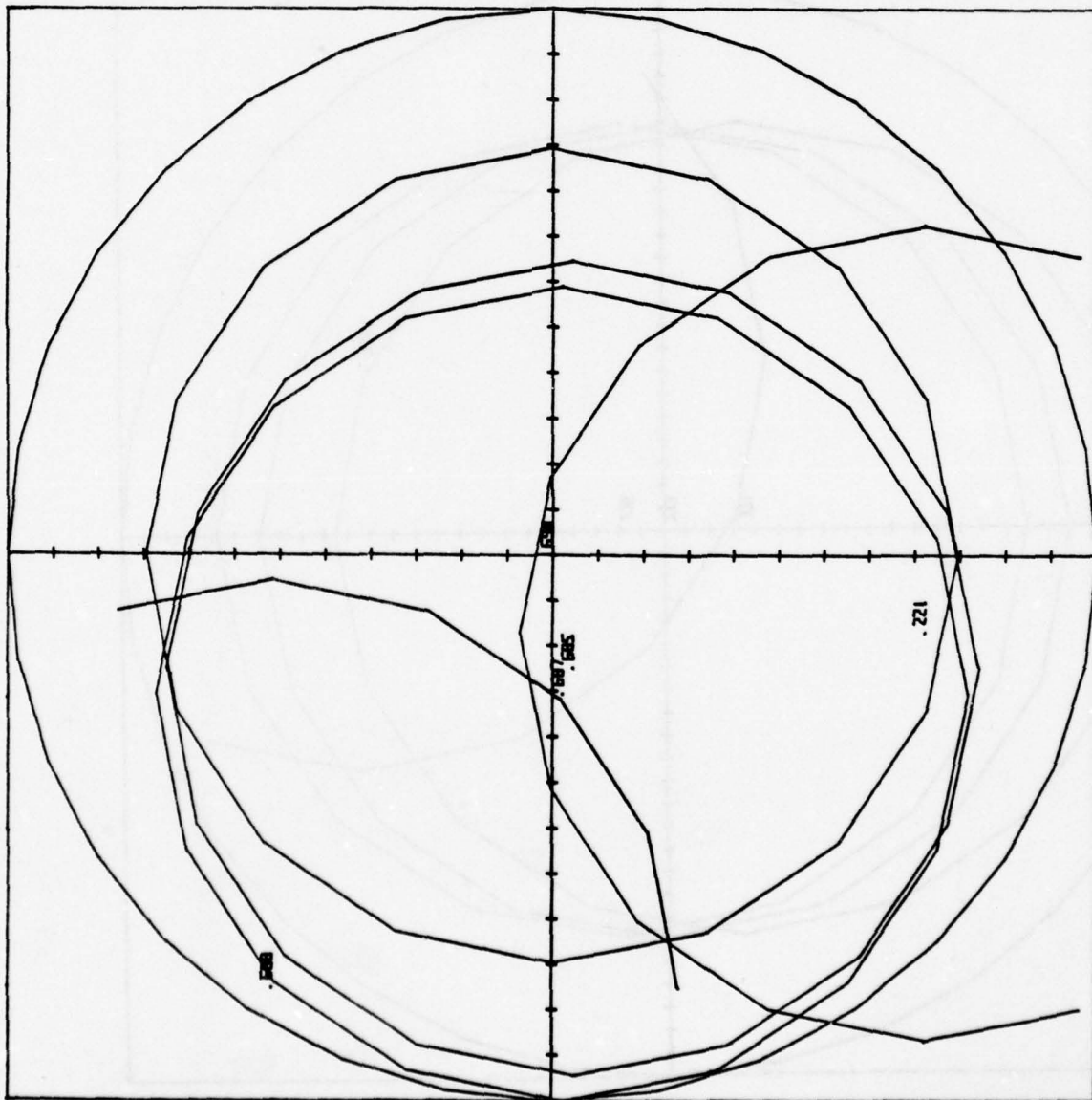
MKE

MILWAUKEE, WIS.

1 LGH 1000 GIVES RADIUS 44.721859  
CE OF ARCH RADIUS 44.721859

1 LE # 690 USED AS NOMINAL SITE

PRIME # 221 WITHIN 42.0316024  
PRIME # 685 WITHIN 12.65309330  
PRIME # 687 WITHIN 15.31844333  
PRIME # 688 WITHIN 56.57574859  
PRIME # 690 WITHIN 0 NM  
\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\*

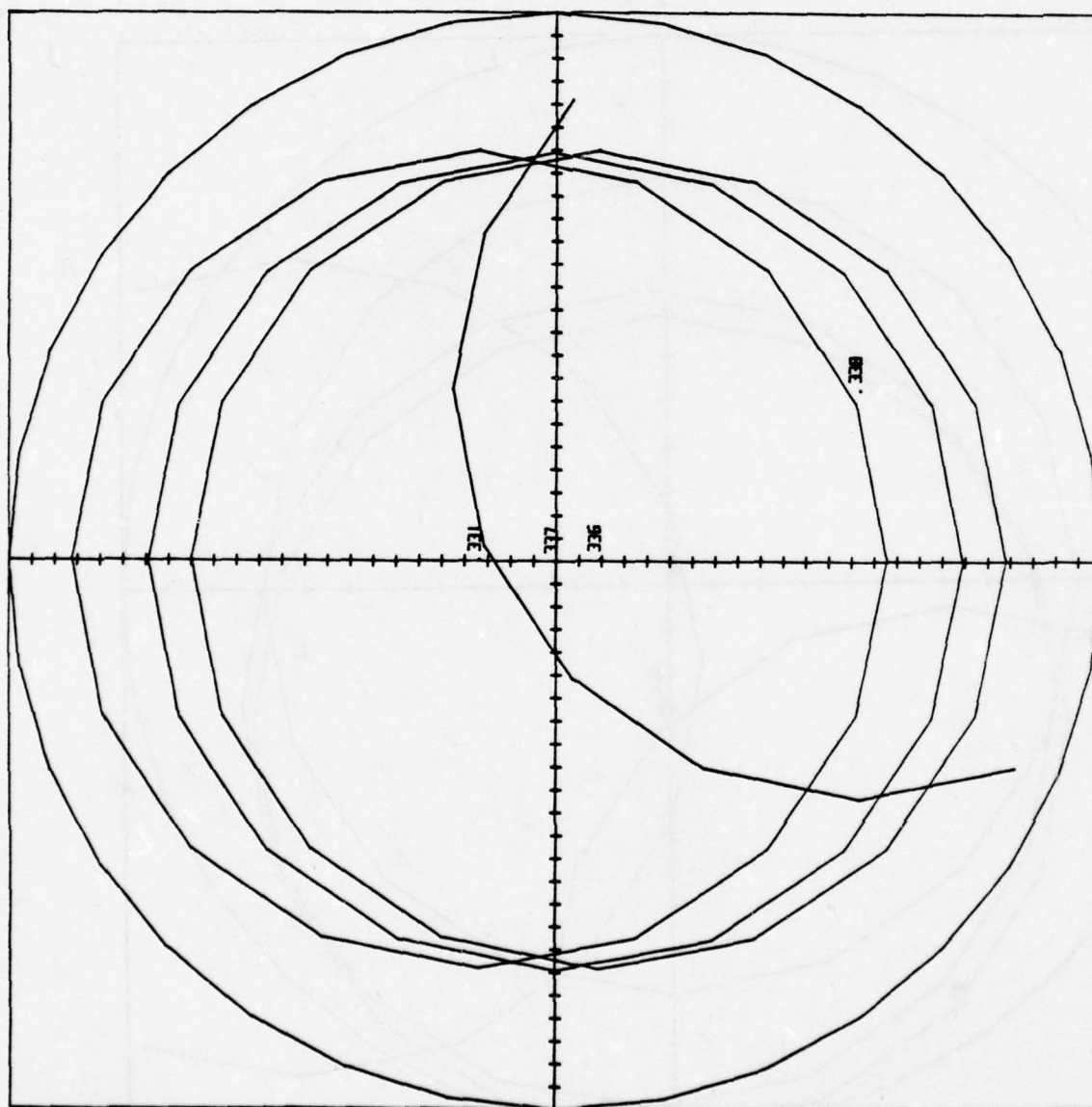


D-97



MSP

MINNEAPOLIS ST. PAUL, MINN.



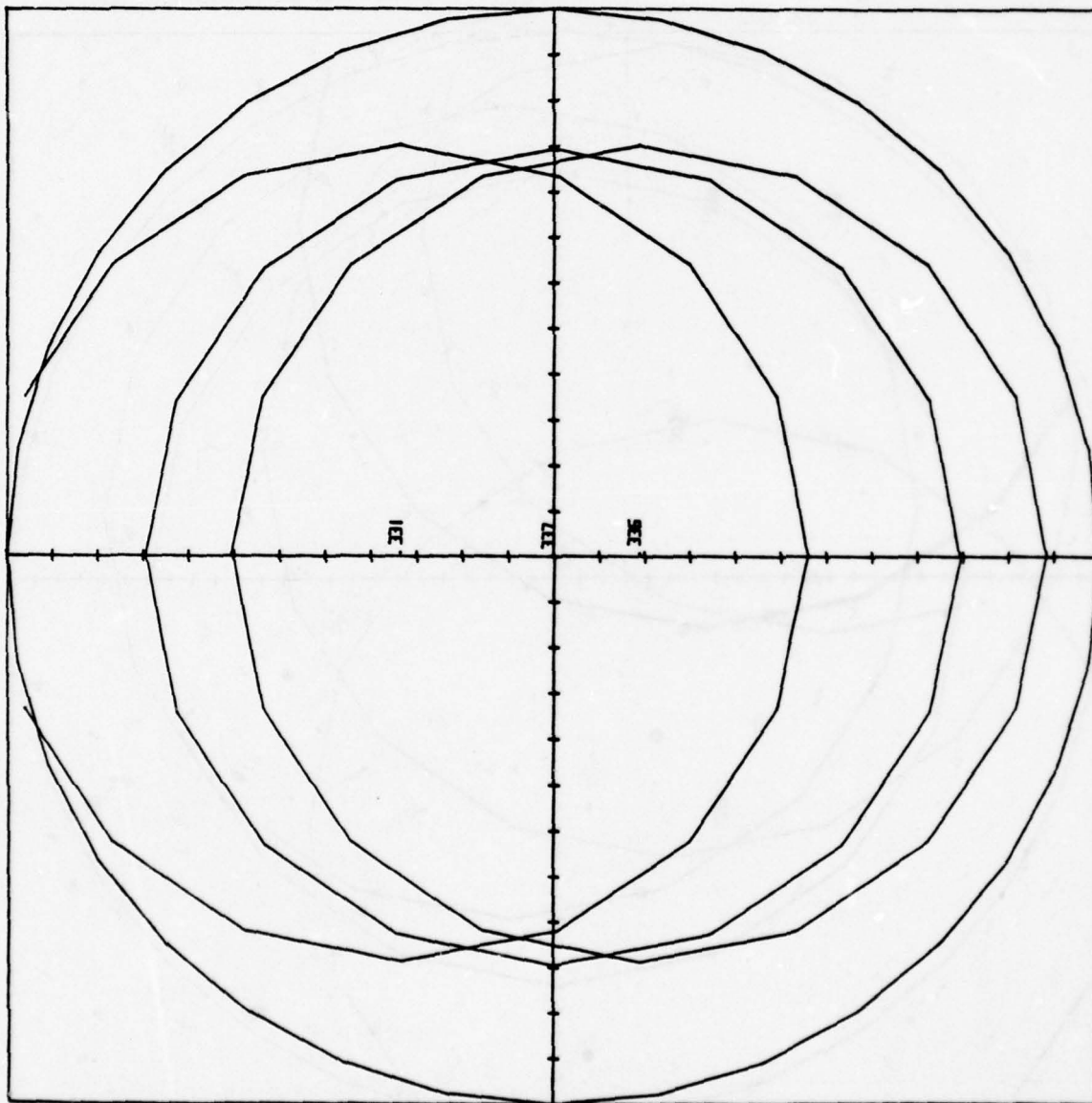
1000 4000 CIRCLES RADIUS 89.442719  
 1000 4000 RADIUS 1000 1000  
 E # 337 USED AS INITIAL SITE  
 GROUP # 331 WITHIN 16.77441052  
 GROUP # 336 WITHIN 9.47015095  
 GROUP # 337 WITHIN 0 100  
 GROUP # 338 WITHIN 76.44802944  
 GROUP # 339 WITHIN 76.64806944  
 \*\*\* \*\*\*\*\*



MSP

MINNEAPOLIS ST. PAUL, MINN.

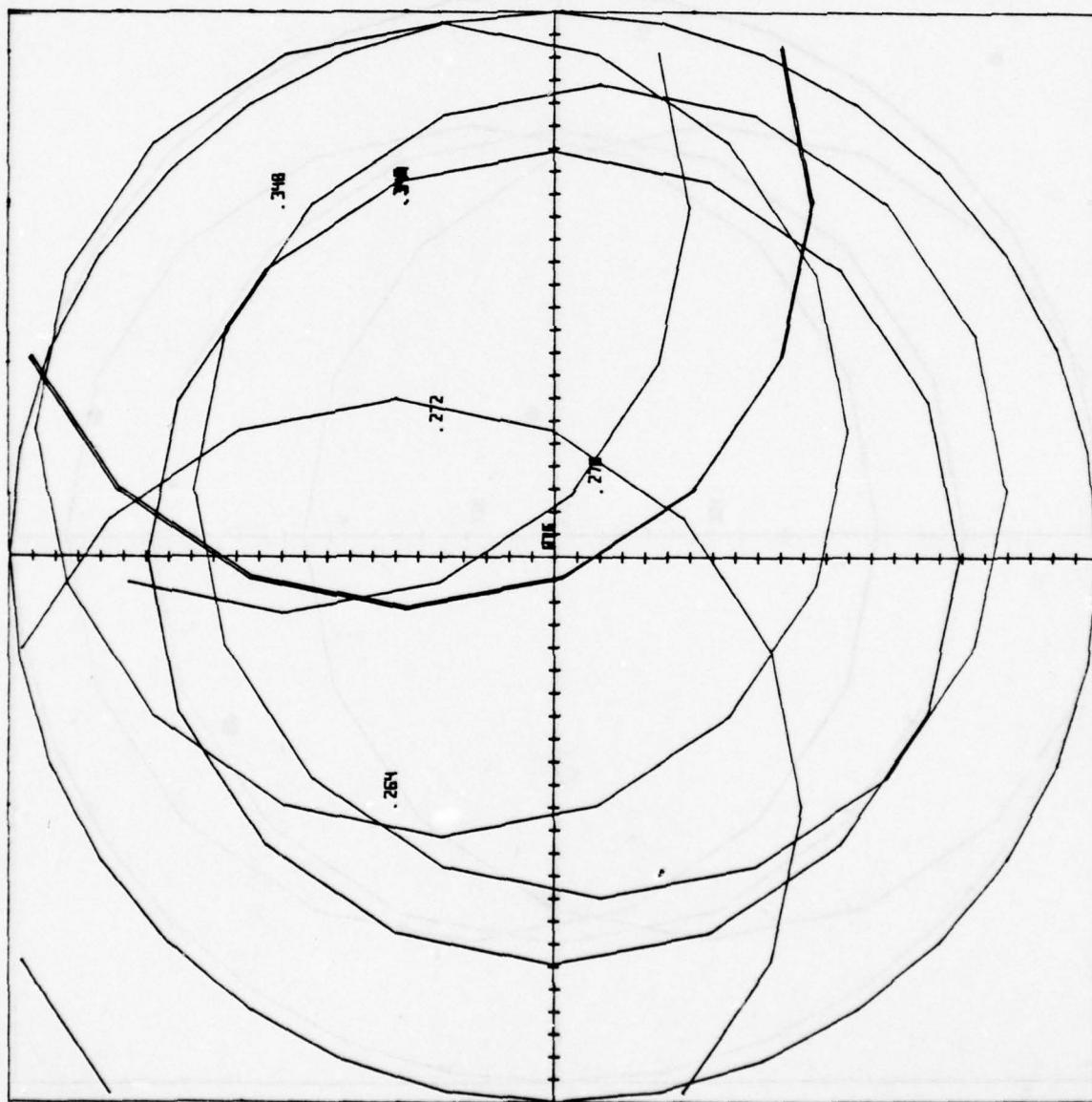
DATE 1000 SITE ERIE RD 44.7217  
CT OF HREN ERIE RD 44.7217  
LE # 237 USED IN HORIZONTAL SITE  
ERIE # 331 HORIZONTAL 16.441052  
ERIE # 336 HORIZONTAL 16.441052  
ERIE # 337 HORIZONTAL 16.441052  
... \*\*\*\*\*





MSY

NEW ORLEANS (MOISANT)



D-100

1200 4000 61705 100005 89.44271  
LE OF OPER PROBID. 0000 120

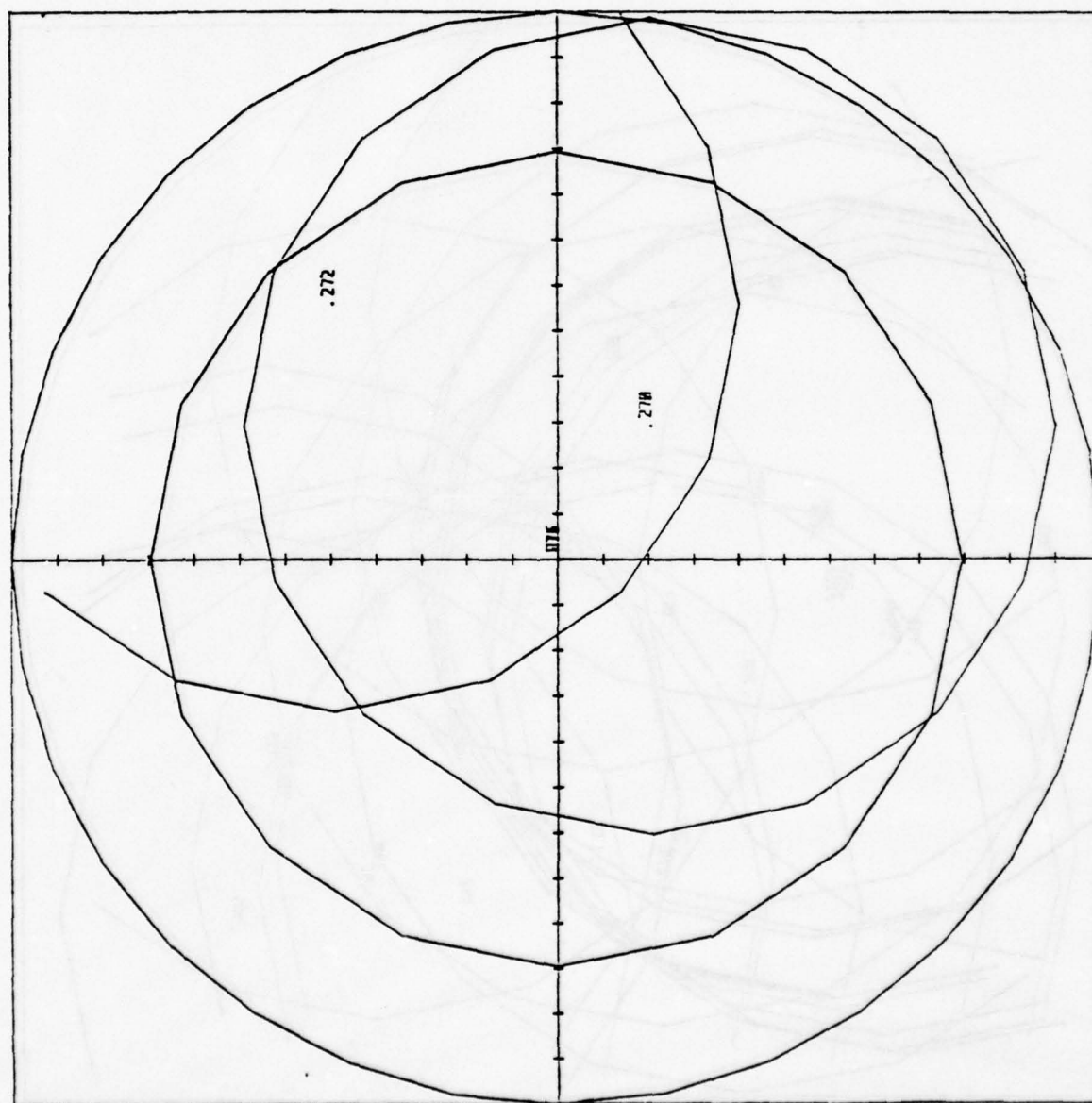
LE # 271 USED AS NORMAL SITE

PROBE # 264	100000	64.7496153
PROBE # 270	100000	17.6408285
PROBE # 271	100000	0
PROBE # 272	100000	37.3491143
PROBE # 344	100000	84.7099540
PROBE # 345	100000	84.3791540
PROBE # 346	100000	84.3791540
PROBE # 347	100000	84.3791540
PROBE # 348	100000	84.3791540
PROBE # 610	100000	84.3791540
PROBE # 611	100000	0



MSY

NEW ORLEANS (MOISANT)



D-101

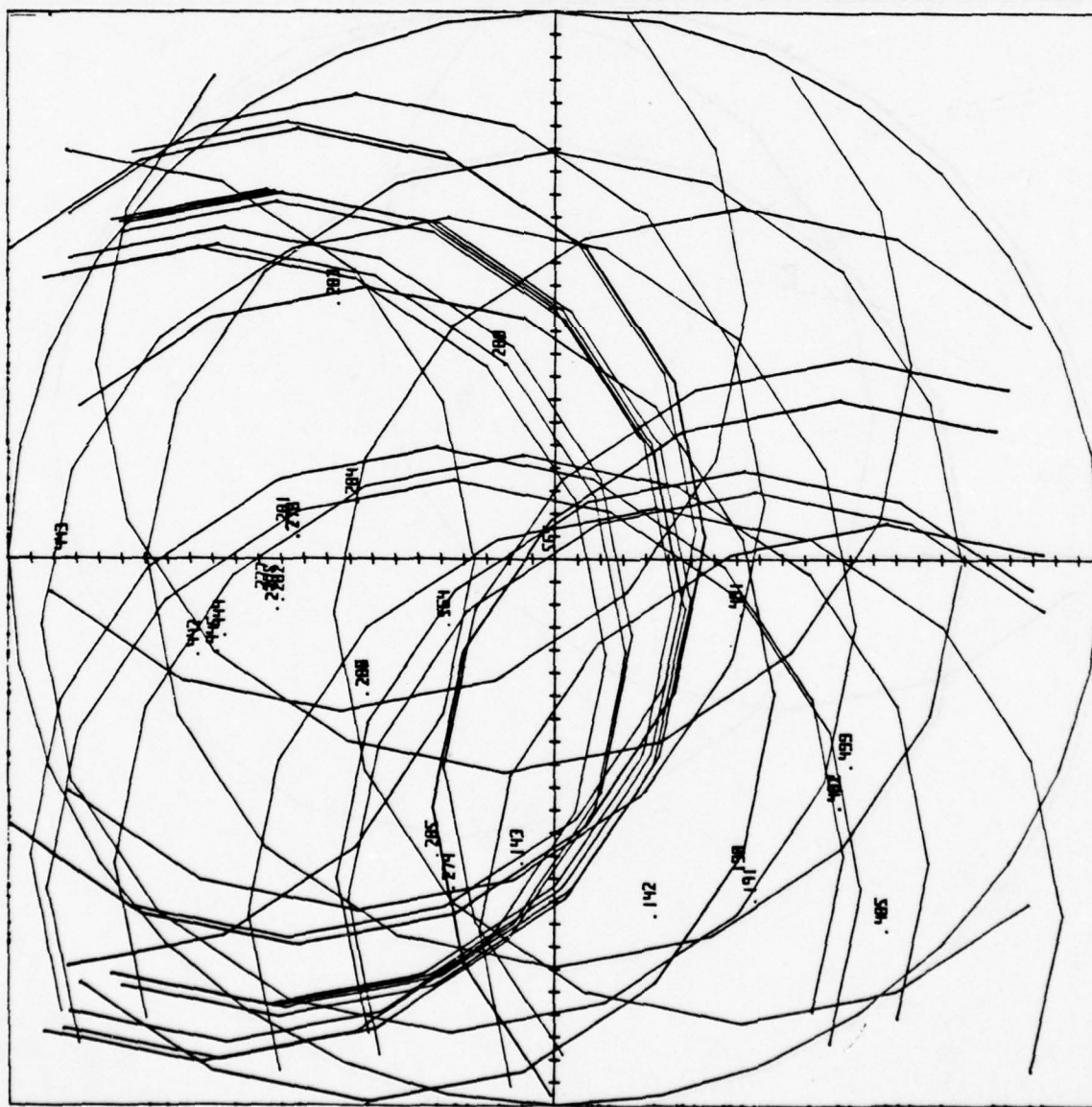
100% 100% 100% 100% 100%

J. L. 100 100 100 100 100

Figure 1 is a schematic representation of the experimental design. It shows a flow from 'Experimental design' to 'Data analysis' and 'Statistical analysis'. 'Experimental design' is linked to 'Data analysis' and 'Statistical analysis'. 'Data analysis' is linked to 'Statistical analysis'. 'Statistical analysis' is linked to 'Data analysis' and 'Statistical analysis'.



PROVIDENCE, R. I.  
QUONSET PT.

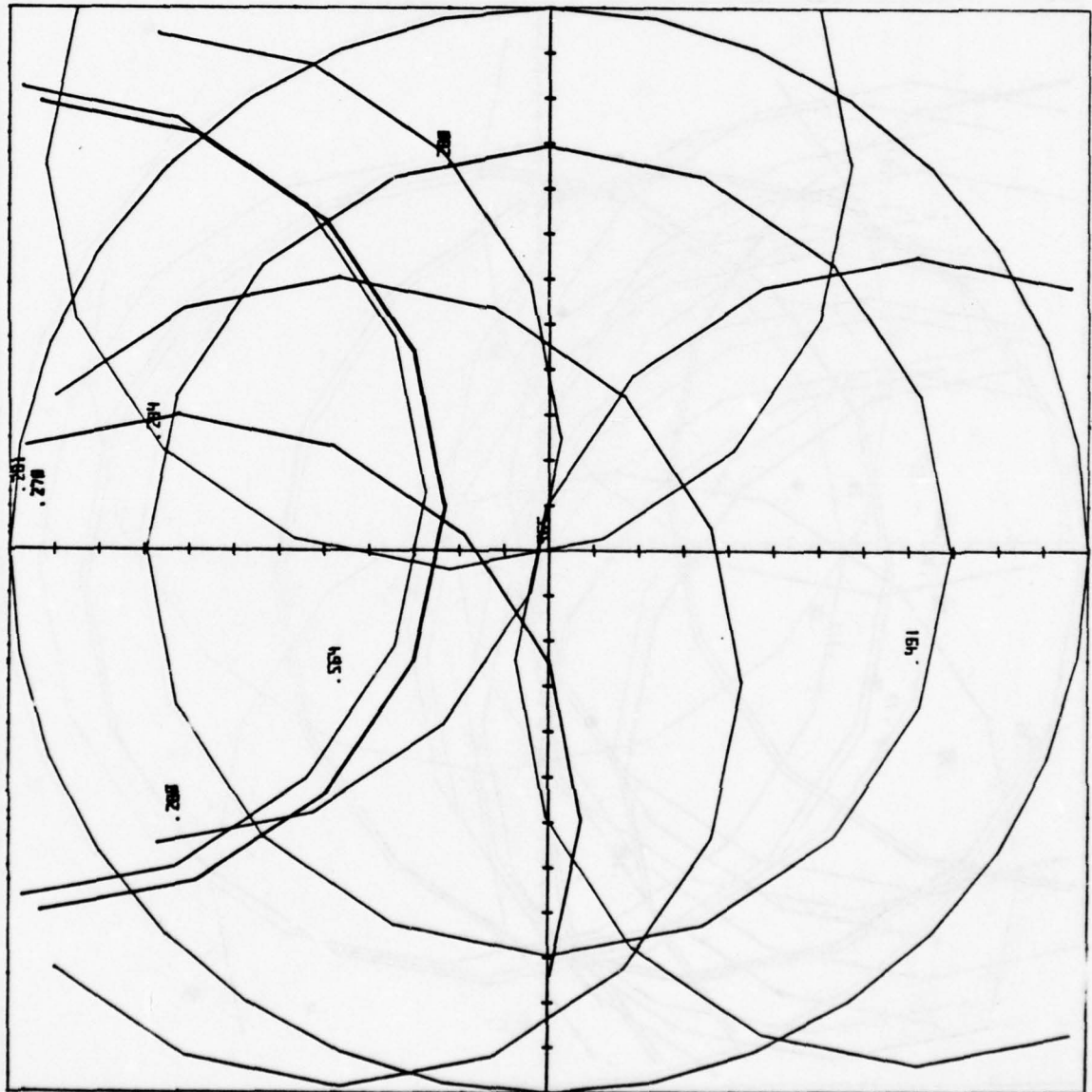


ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED  
DATE 04-11-2008 BY 60322 UCBAW

FILE # 565 U.S.D. NO. 1004444L CITE

[illegible]





D-103

N C O

PROVIDENCE, R. I.  
QUONSET PT.

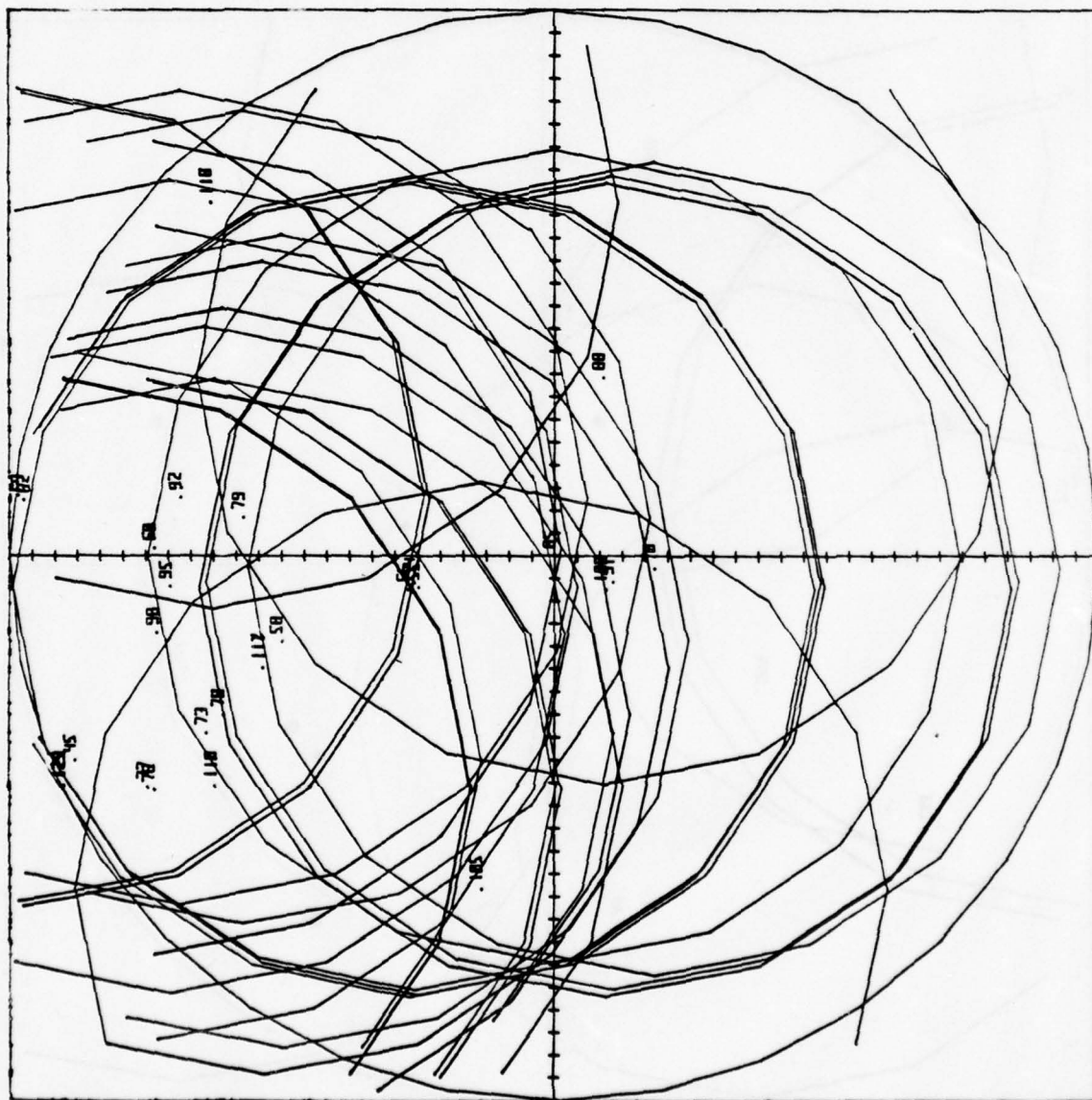
1 LIGHT 1000 GIVES RADIUS 44.7213  
2E OF HFEH RADIUS 44.7213

1E # 565 USED AS NOMINAL SITE

POINT #	278	WITHIN	56.67152692
POINT #	279	WITHIN	56.49175019
POINT #	280	WITHIN	44.10932796
POINT #	281	WITHIN	58.83418342
POINT #	282	WITHIN	47.13417363
POINT #	283	WITHIN	50.76016993
POINT #	284	WITHIN	50.76016993
POINT #	491	WITHIN	42.76846207
POINT #	564	WITHIN	27.40068523
POINT #	565	WITHIN	0

... \*\*\*\*\*





D-104

N K X

SAN DIEGO, CALIF.

IR LIGHT 4000 GIVES RADIUS 89.44271910  
SIZE OF OPEN RADIUS 100.120

FILE # 85 USED AS NORMAL SITE

RADIUS # 45	114.622782
RADIUS # 54	11.3425117
RADIUS # 55	30.7145267
RADIUS # 56	32.9495391
RADIUS # 58	62.0528891
RADIUS # 59	88.04541715
RADIUS # 60	88.04541715
RADIUS # 62	118.445889
RADIUS # 63	117.6459779
RADIUS # 64	117.6459779
RADIUS # 70	22.19807306
RADIUS # 73	85.84254961
RADIUS # 74	80.746223
RADIUS # 75	80.746223
RADIUS # 76	101.9679166
RADIUS # 77	102.7046766
RADIUS # 79	68.95580023
RADIUS # 85	0 NM
RADIUS # 88	40.70711494
RADIUS # 91	14.05613105
RADIUS # 92	83.2727307
RADIUS # 93	84.7722407
RADIUS # 98	88.07639975
RADIUS # 105	74.08621782
RADIUS # 106	13.44451955
RADIUS # 107	13.44451955
RADIUS # 108	13.44451955
RADIUS # 110	13.44451955
RADIUS # 111	40.0123064
RADIUS # 112	68.77638799
RADIUS # 113	68.77638799
RADIUS # 114	103.0961715
RADIUS # 117	103.0961715
RADIUS # 123	119.1520067
RADIUS # 124	119.1520067
RADIUS # 125	119.1520067
RADIUS # 126	119.1520067
RADIUS # 127	119.1520067
RADIUS # 128	119.1520067
RADIUS # 129	119.1520067
RADIUS # 130	119.1520067
RADIUS # 131	119.1520067
RADIUS # 132	119.1520067
RADIUS # 133	119.1520067
RADIUS # 134	119.1520067
RADIUS # 135	119.1520067
RADIUS # 136	119.1520067
RADIUS # 137	119.1520067
RADIUS # 138	119.1520067
RADIUS # 139	119.1520067
RADIUS # 140	119.1520067
RADIUS # 141	119.1520067
RADIUS # 142	119.1520067
RADIUS # 143	119.1520067
RADIUS # 144	119.1520067
RADIUS # 145	119.1520067
RADIUS # 146	119.1520067
RADIUS # 147	119.1520067
RADIUS # 148	119.1520067
RADIUS # 149	119.1520067
RADIUS # 150	119.1520067
RADIUS # 151	119.1520067
RADIUS # 152	119.1520067
RADIUS # 153	119.1520067
RADIUS # 154	119.1520067
RADIUS # 155	119.1520067
RADIUS # 156	119.1520067
RADIUS # 157	119.1520067
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RADIUS # 166	119.1520067
RADIUS # 167	119.1520067
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RADIUS # 190	119.1520067
RADIUS # 191	119.1520067
RADIUS # 192	119.1520067
RADIUS # 193	119.1520067
RADIUS # 194	119.1520067
RADIUS # 195	119.1520067
RADIUS # 196	119.1520067
RADIUS # 197	119.1520067
RADIUS # 198	119.1520067
RADIUS # 199	119.1520067
RADIUS # 200	119.1520067



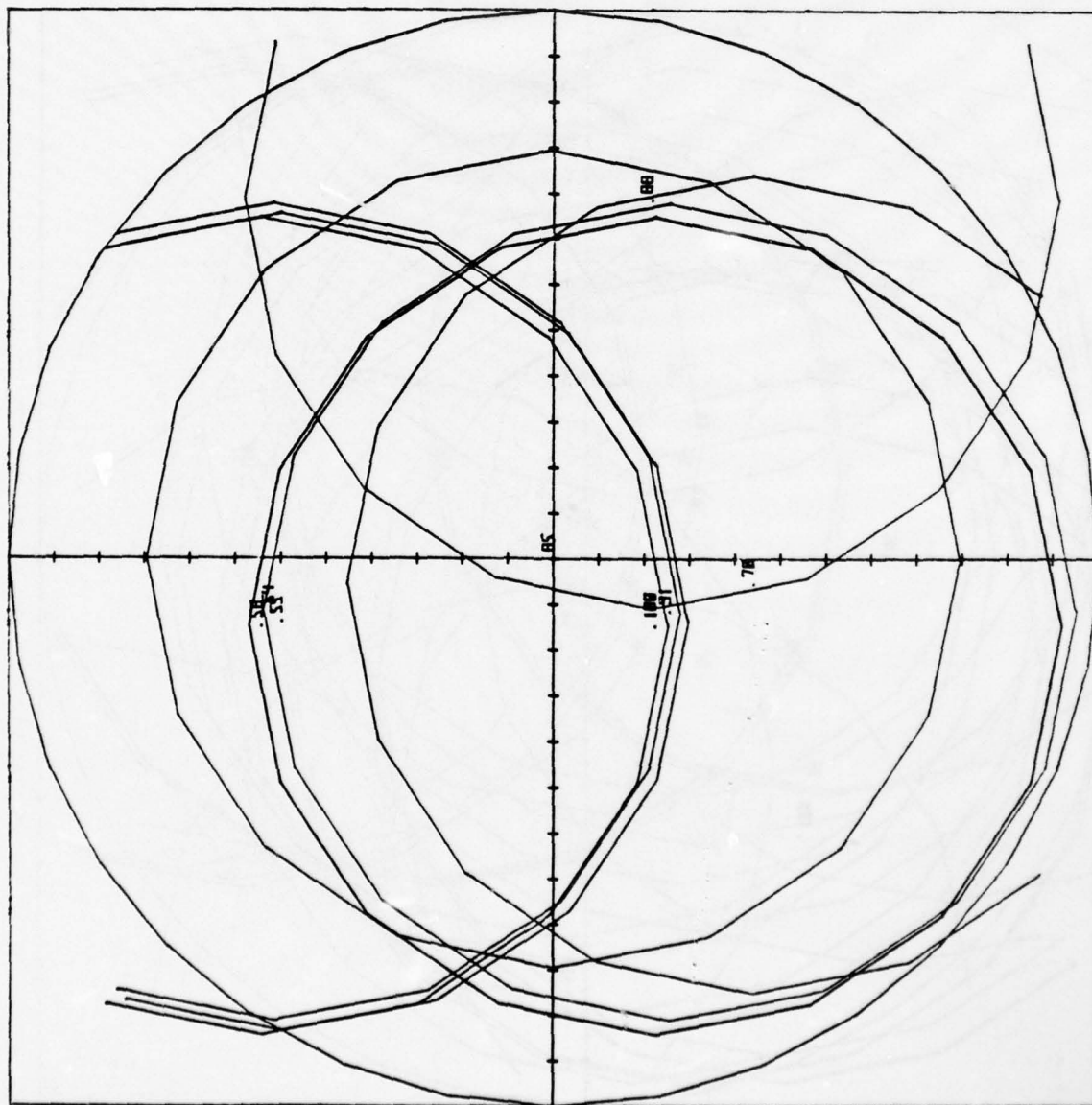
N K X

SAN DIEGO, CALIF.

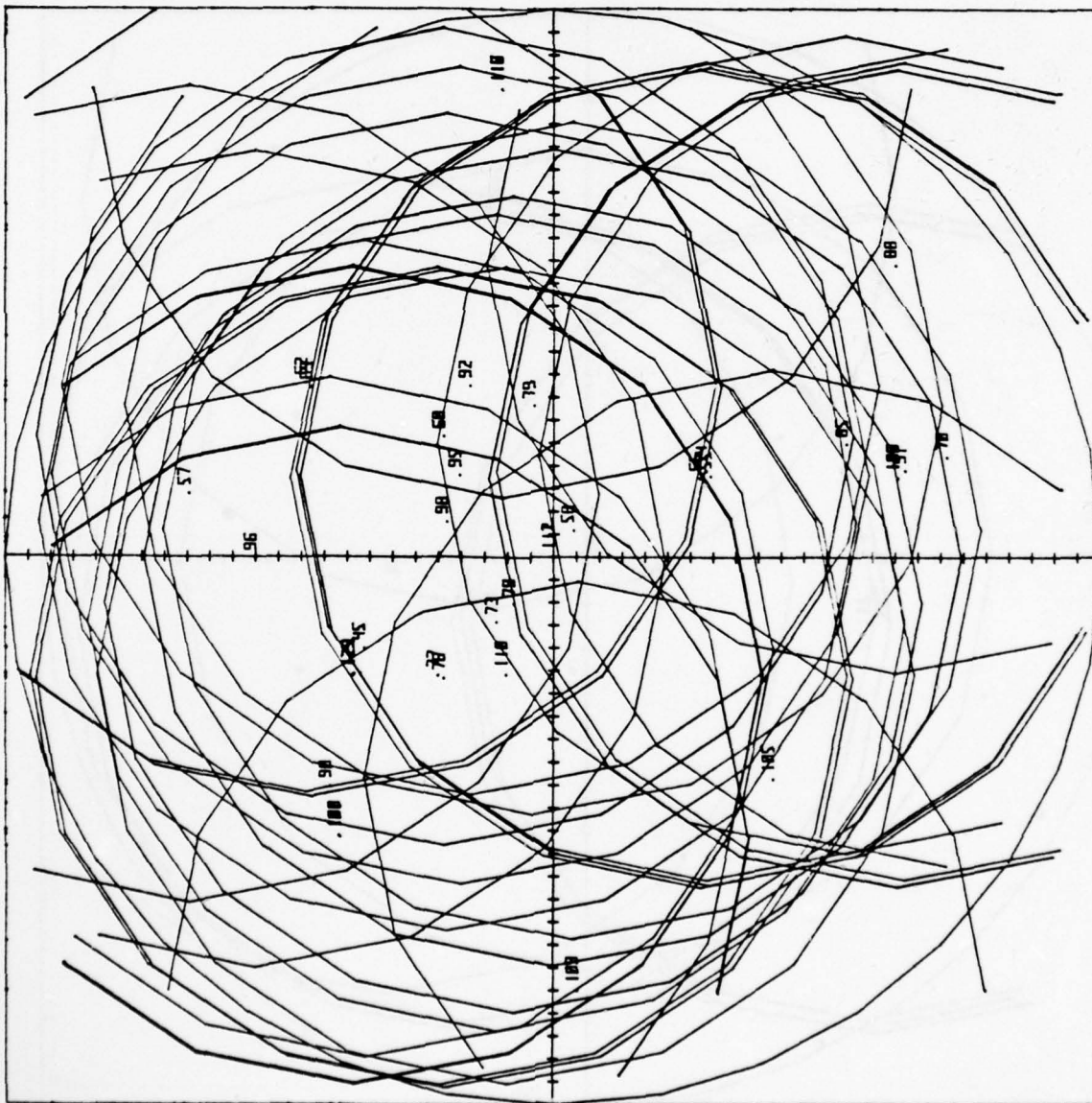
PORT 1000 GIVE P00105 44.72125  
 DE OF RHEM P00105 44.72125

LE # 35 USED AS INITIAL SLICE

P00105 # 54 WITHIN 11.3423011  
 P00105 # 55 WITHIN 10.1452367  
 P00105 # 56 WITHIN 22.9495291  
 P00105 # 70 WITHIN 22.15007206  
 P00105 # 85 WITHIN 0.0000000  
 P00105 # 88 WITHIN 40.7011494  
 P00105 # 91 WITHIN 14.0321305  
 P00105 # 106 WITHIN 13.4445195  
 P00105 # 107 WITHIN 13.4445195  
 P00105 # 108 WITHIN 13.4445195







N Z J

SANTA ANA, CALIF.

BLIGHT 4000 GIVES 100105 89.44271910  
SIZE of 100105 100105 120

FILE # 111 USED AS BOUNDARY SITE

PROBE # 45	100105	45.9461506	100
PROBE # 54	100105	45.9461506	100
PROBE # 55	100105	45.9461506	100
PROBE # 56	100105	45.9461506	100
PROBE # 57	100105	45.9461506	100
PROBE # 58	100105	45.9461506	100
PROBE # 59	100105	45.9461506	100
PROBE # 60	100105	45.9461506	100
PROBE # 61	100105	45.9461506	100
PROBE # 62	100105	45.9461506	100
PROBE # 63	100105	45.9461506	100
PROBE # 64	100105	45.9461506	100
PROBE # 65	100105	45.9461506	100
PROBE # 66	100105	45.9461506	100
PROBE # 67	100105	45.9461506	100
PROBE # 68	100105	45.9461506	100
PROBE # 69	100105	45.9461506	100
PROBE # 70	100105	45.9461506	100
PROBE # 71	100105	45.9461506	100
PROBE # 72	100105	45.9461506	100
PROBE # 73	100105	45.9461506	100
PROBE # 74	100105	45.9461506	100
PROBE # 75	100105	45.9461506	100
PROBE # 76	100105	45.9461506	100
PROBE # 77	100105	45.9461506	100
PROBE # 78	100105	45.9461506	100
PROBE # 79	100105	45.9461506	100
PROBE # 80	100105	45.9461506	100
PROBE # 81	100105	45.9461506	100
PROBE # 82	100105	45.9461506	100
PROBE # 83	100105	45.9461506	100
PROBE # 84	100105	45.9461506	100
PROBE # 85	100105	45.9461506	100
PROBE # 86	100105	45.9461506	100
PROBE # 87	100105	45.9461506	100
PROBE # 88	100105	45.9461506	100
PROBE # 89	100105	45.9461506	100
PROBE # 90	100105	45.9461506	100
PROBE # 91	100105	45.9461506	100
PROBE # 92	100105	45.9461506	100
PROBE # 93	100105	45.9461506	100
PROBE # 94	100105	45.9461506	100
PROBE # 95	100105	45.9461506	100
PROBE # 96	100105	45.9461506	100
PROBE # 97	100105	45.9461506	100
PROBE # 98	100105	45.9461506	100
PROBE # 99	100105	45.9461506	100
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PROBE # 101	100105	45.9461506	100
PROBE # 102	100105	45.9461506	100
PROBE # 103	100105	45.9461506	100
PROBE # 104	100105	45.9461506	100
PROBE # 105	100105	45.9461506	100
PROBE # 106	100105	45.9461506	100
PROBE # 107	100105	45.9461506	100
PROBE # 108	100105	45.9461506	100
PROBE # 109	100105	45.9461506	100
PROBE # 110	100105	45.9461506	100
PROBE # 111	100105	45.9461506	100
PROBE # 112	100105	45.9461506	100
PROBE # 113	100105	45.9461506	100
PROBE # 114	100105	45.9461506	100
PROBE # 115	100105	45.9461506	100
PROBE # 116	100105	45.9461506	100
PROBE # 117	100105	45.9461506	100
PROBE # 118	100105	45.9461506	100
PROBE # 119	100105	45.9461506	100
PROBE # 120	100105	45.9461506	100



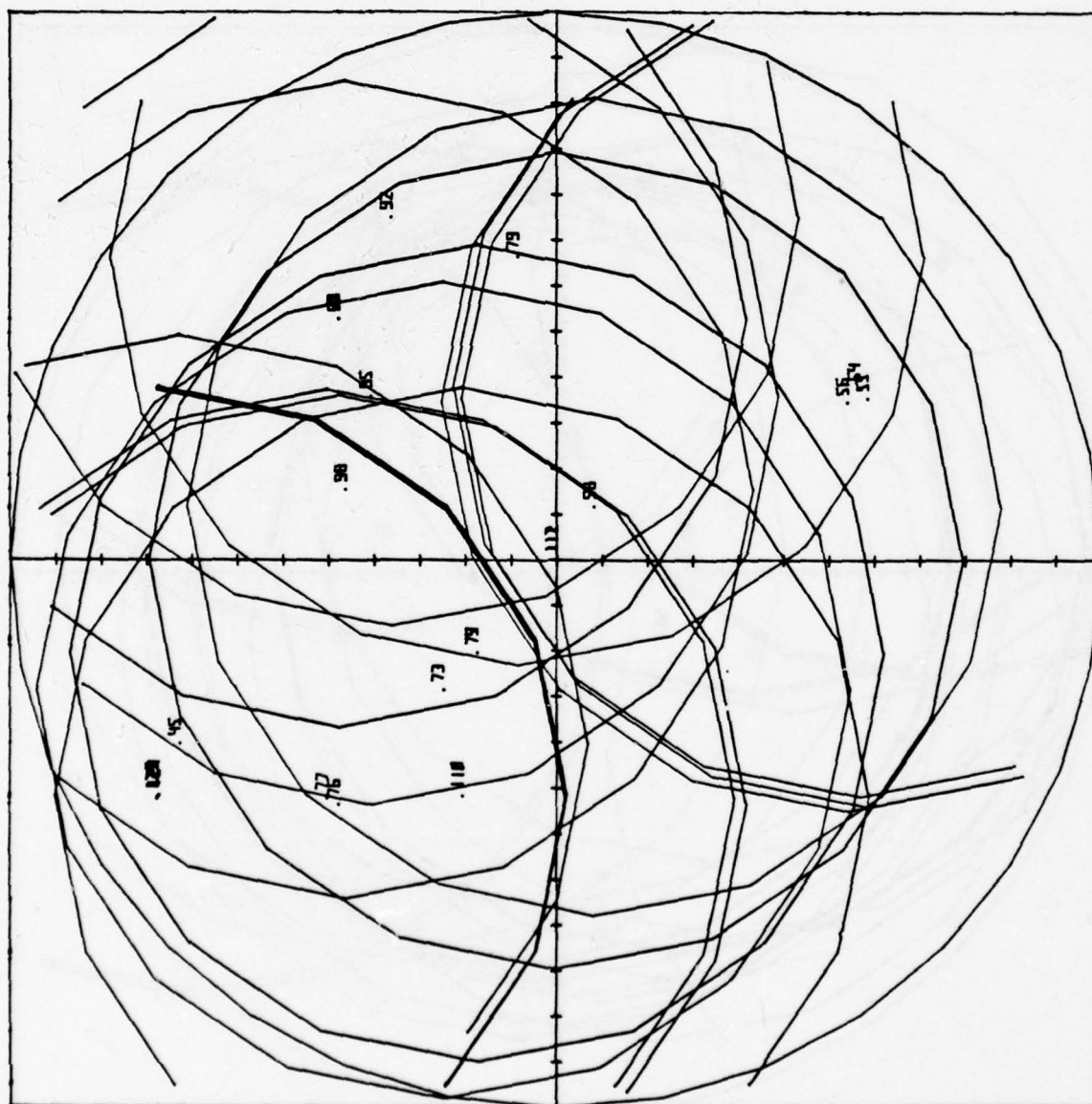
N Z J

SANTA ANA, CALIF.

RECORD 1000 51745 PLOT 44.721-5955  
 FILE OF RECH PLOT 44.721-5955

1-11 # 111 USED AS INITIAL SITE

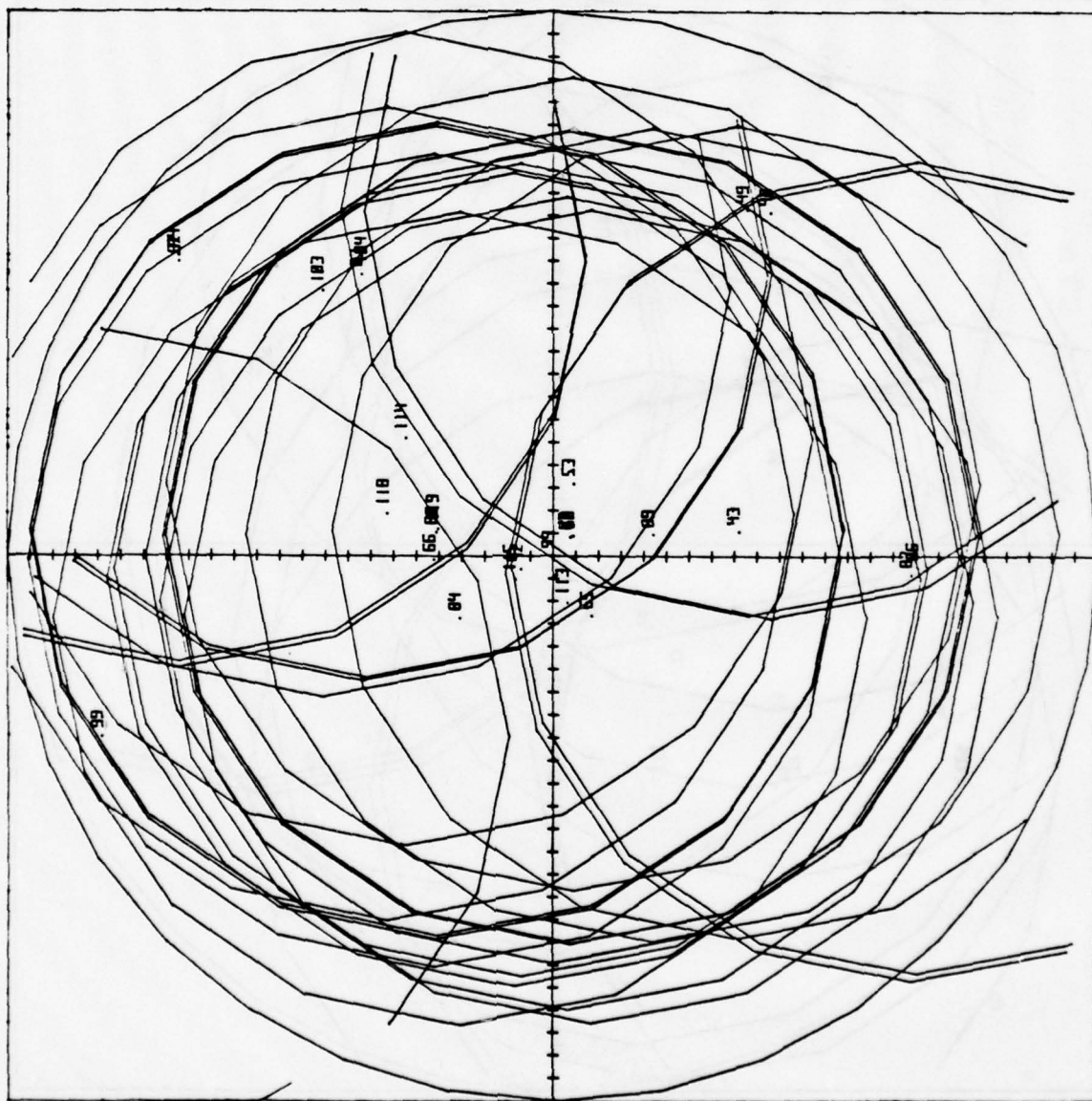
Plot # 45	WITHIN 45.94615406	N
Plot # 54	WITHIN 50.7539318	N
Plot # 55	WITHIN 50.5899565	N
Plot # 56	WITHIN 50.43903260	N
Plot # 58	WITHIN 50.213832	HM
Plot # 59	WITHIN 50.57438862	N
Plot # 60	WITHIN 50.57438862	N
Plot # 73	WITHIN 18.8020109	N
Plot # 74	WITHIN 13.8963170	N
Plot # 75	WITHIN 13.8963170	N
Plot # 76	WITHIN 35.7631855	N
Plot # 77	WITHIN 35.1243179	N
Plot # 79	WITHIN 33.4330344	N
Plot # 92	WITHIN 41.62714037	N
Plot # 95	WITHIN 37.10821743	N
Plot # 98	WITHIN 34.3722474	N
Plot # 109	WITHIN 37.7482951	N
Plot # 110	WITHIN 37.7482951	N
Plot # 111	WITHIN 37.7482951	N
Plot # 112	WITHIN 37.7482951	N
Plot # 123	WITHIN 50.7775753	HM
Plot # 124	WITHIN 50.7775753	HM
Plot # 125	WITHIN 50.7775753	HM





OAK

OAKLAND, CALIF.



W. L. L. 4000 C. 1000 00.44271910  
S. L. E. 00.00 00.00 100

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

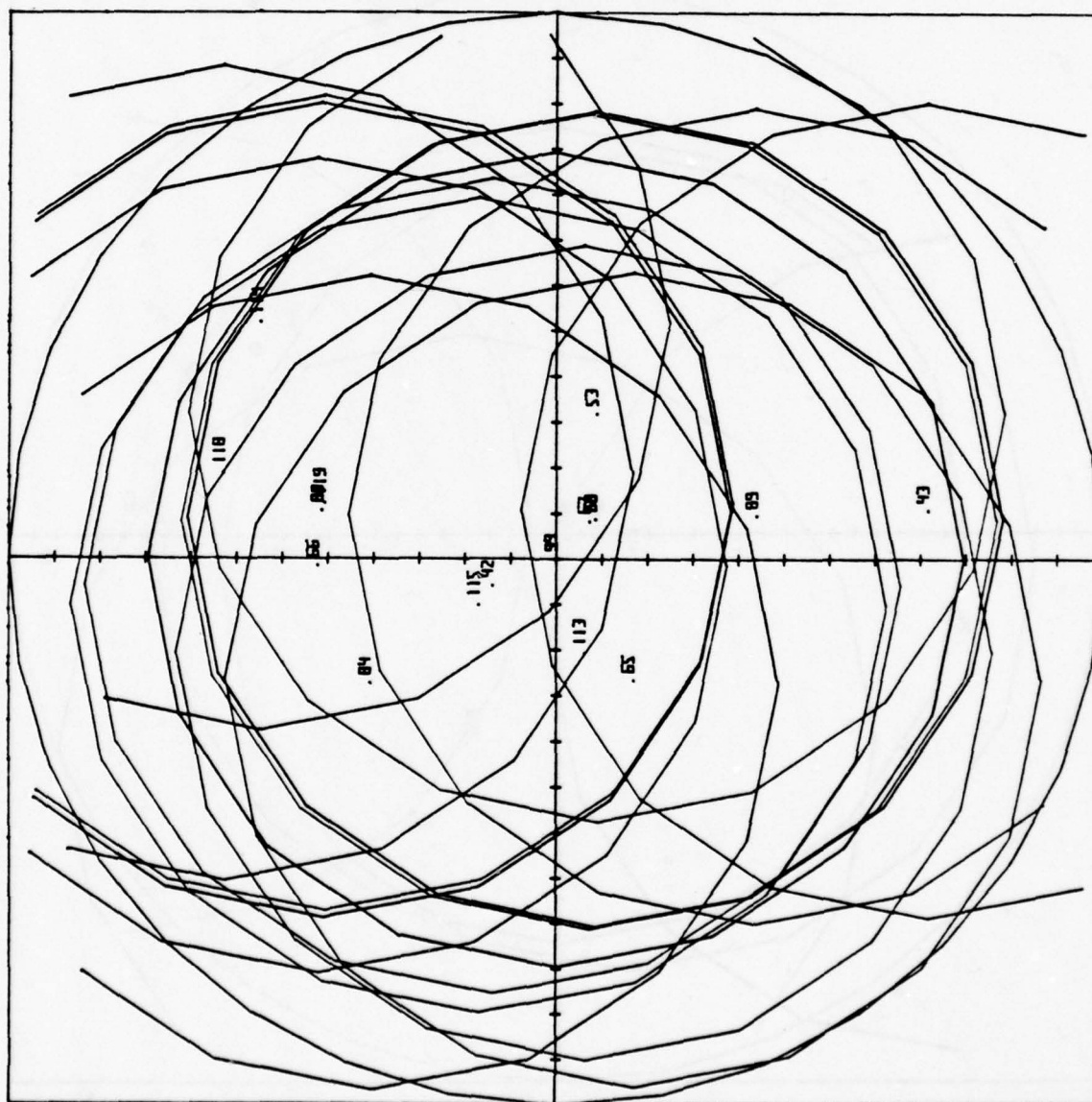
00000	00.000000
00001	00.000000
00002	00.000000
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00005	00.000000
00006	00.000000
00007	00.000000
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00009	00.000000
00010	00.000000
00011	00.000000
00012	00.000000
00013	00.000000
00014	00.000000
00015	00.000000
00016	00.000000
00017	00.000000
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00019	00.000000
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00087	00.000000
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00089	00.000000
00090	00.000000
00091	00.000000
00092	00.000000
00093	00.000000
00094	00.000000
00095	00.000000
00096	00.000000
00097	00.000000
00098	00.000000
00099	00.000000
00100	00.000000



**OAKLAND, CALIF.**

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DATE 06-06-2001 BY 60321 UCBAW

ILL. # 94 - U.S. DE. HOMEL. SEC.

[illegible]



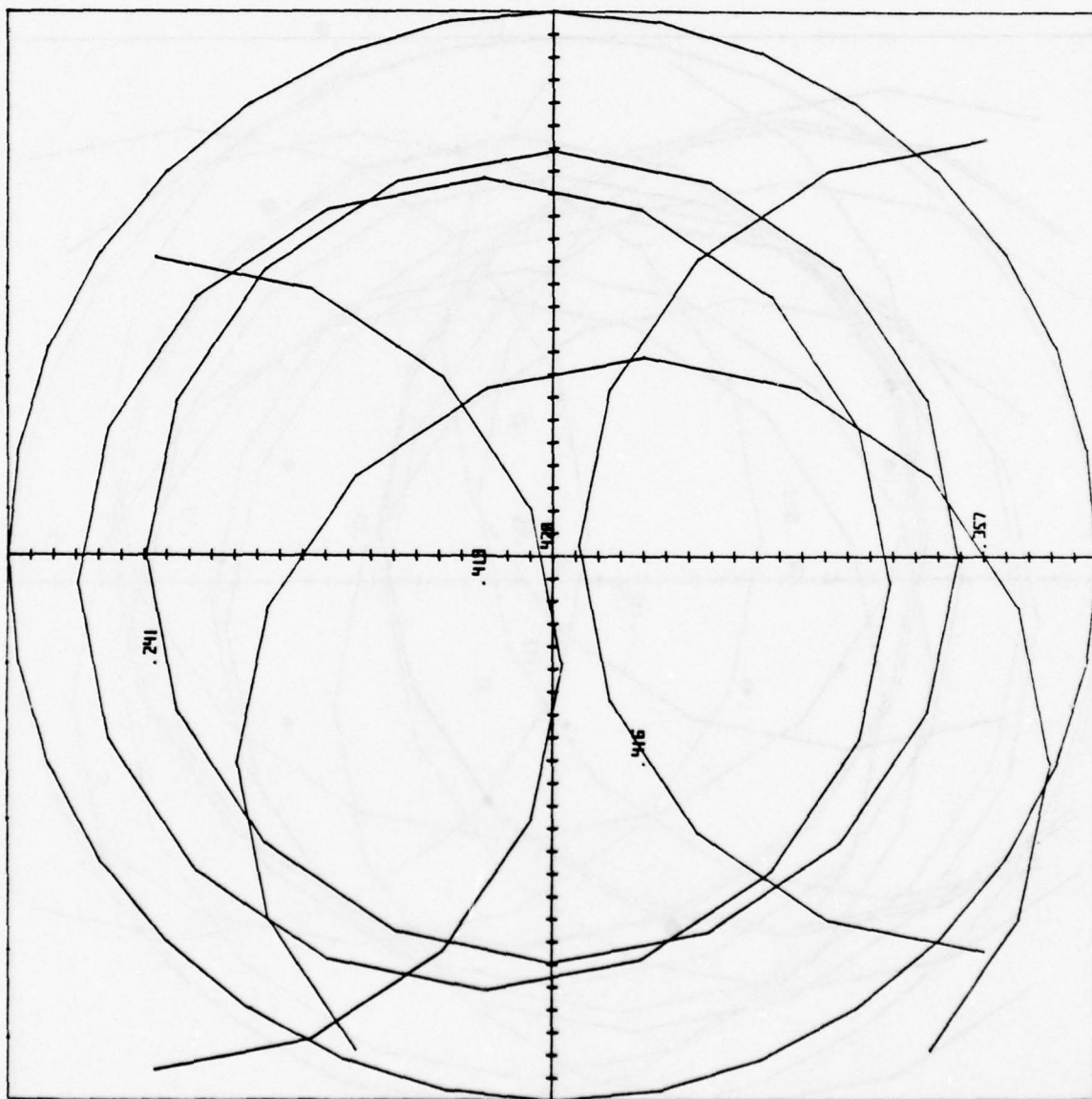
OFF

OMAHA, NEB.  
OFFUTT AFB

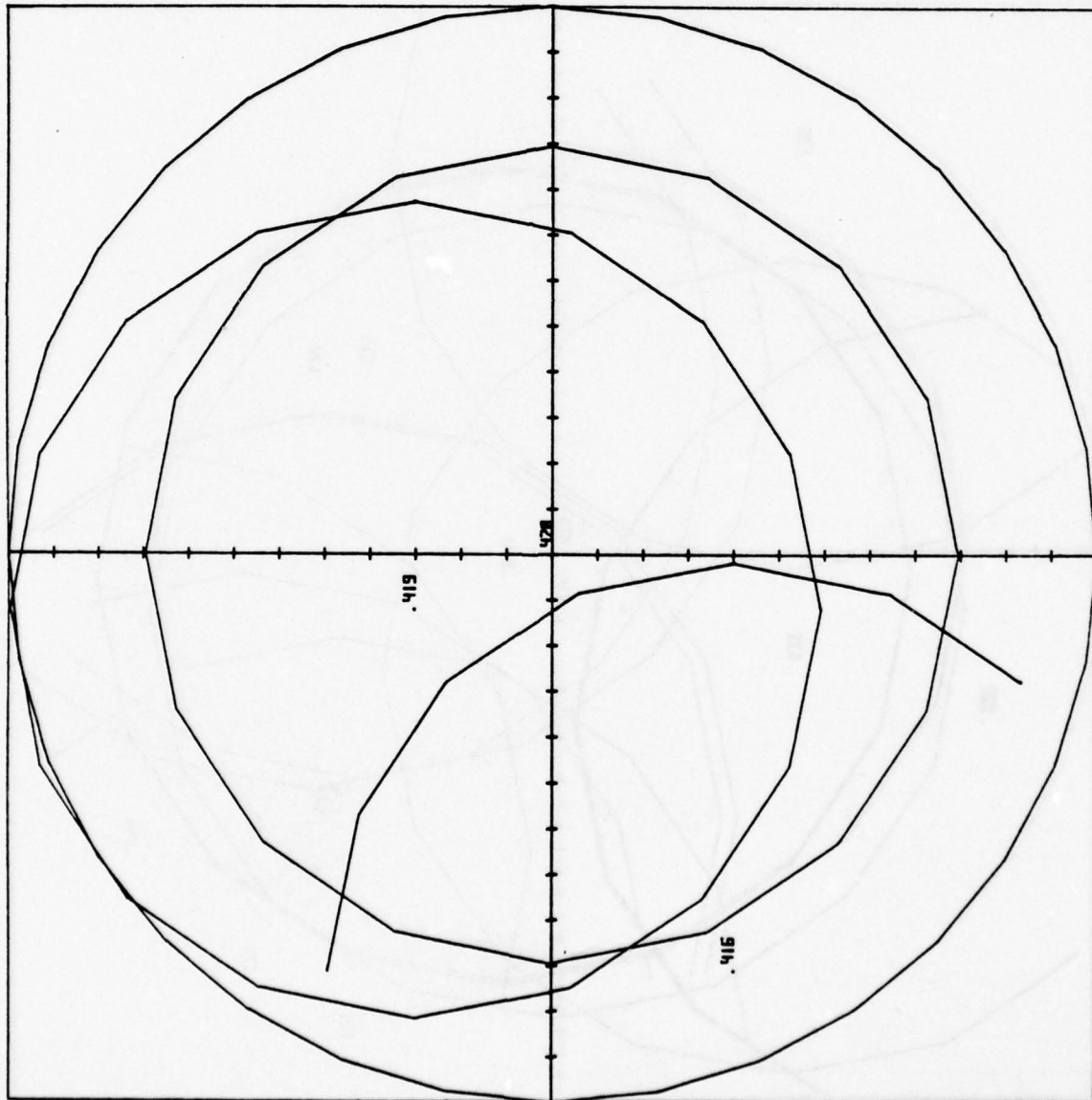
0000 4000 6190 6000 89 44271  
AL OF AREA F00000 0000 120

11 # 420 USED AS HORIZONTAL SITE

POINT # 241 00000 90.58880144  
POINT # 357 00000 95.5946427  
POINT # 416 00000 42.81674624  
POINT # 419 00000 16.26893285  
POINT # 420 00000 0 00  
... \*\*\*\*\*







D-111

OFF

OMAHA, NEB.  
OFFUTT AFB

1000 1000 GIVES RADIUS 44.7212  
CE OF AREA RADIUS 44.7212  
LE # 420 USED AS NOMINAL SITE  
RADIUS # 415 WITHIN 19.81879624  
RADIUS # 415 WITHIN 16.28899295  
RADIUS # 420 WITHIN 0.00000000  
... \*\*\*\*\*

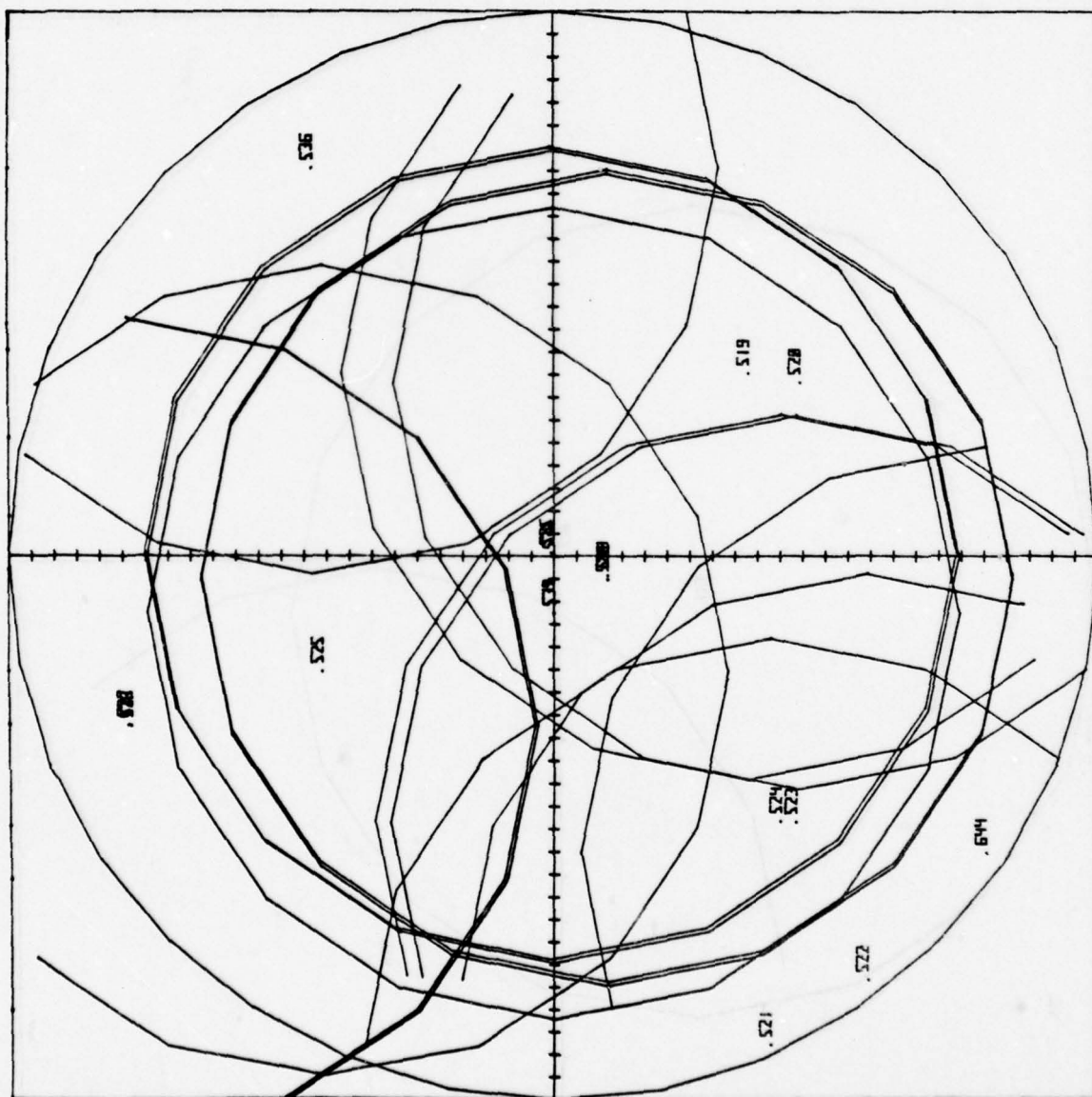


**OKLAHOMA CITY, OKLAHOMA**

"LIGHT 4000" GIVEN RADIUS 89.4427  
 LIE OF AREA RADIUS 120

FILE # 532 USED AS NOMINAL SITE

Frage # 519	Wahr	58,8623351	100
Frage # 520	Wahr	66,4536654	
Frage # 521	Wahr	11,7745084	
Frage # 522	Wahr	116,2661382	
Frage # 523	Wahr	79,3716017	
Frage # 524	Wahr	76,9236384	100
Frage # 525	Wahr	56,86040962	
Frage # 526	Wahr	100,1163408	
Frage # 527	Wahr	100,6868998	
Frage # 528	Wahr	12,91369417	
Frage # 529	Wahr	12,59487453	
Frage # 530	Wahr	12,91589117	
Frage # 531	Wahr	12,59430564	
Frage # 532	Wahr	n	100
Frage # 533	Wahr	12,59307664	
Frage # 534	Wahr	12,5925141	
Frage # 535	Wahr	1,004942731	
Frage # 536	Wahr	100,6438613	
Frage # 544	Wahr	115,6007329	

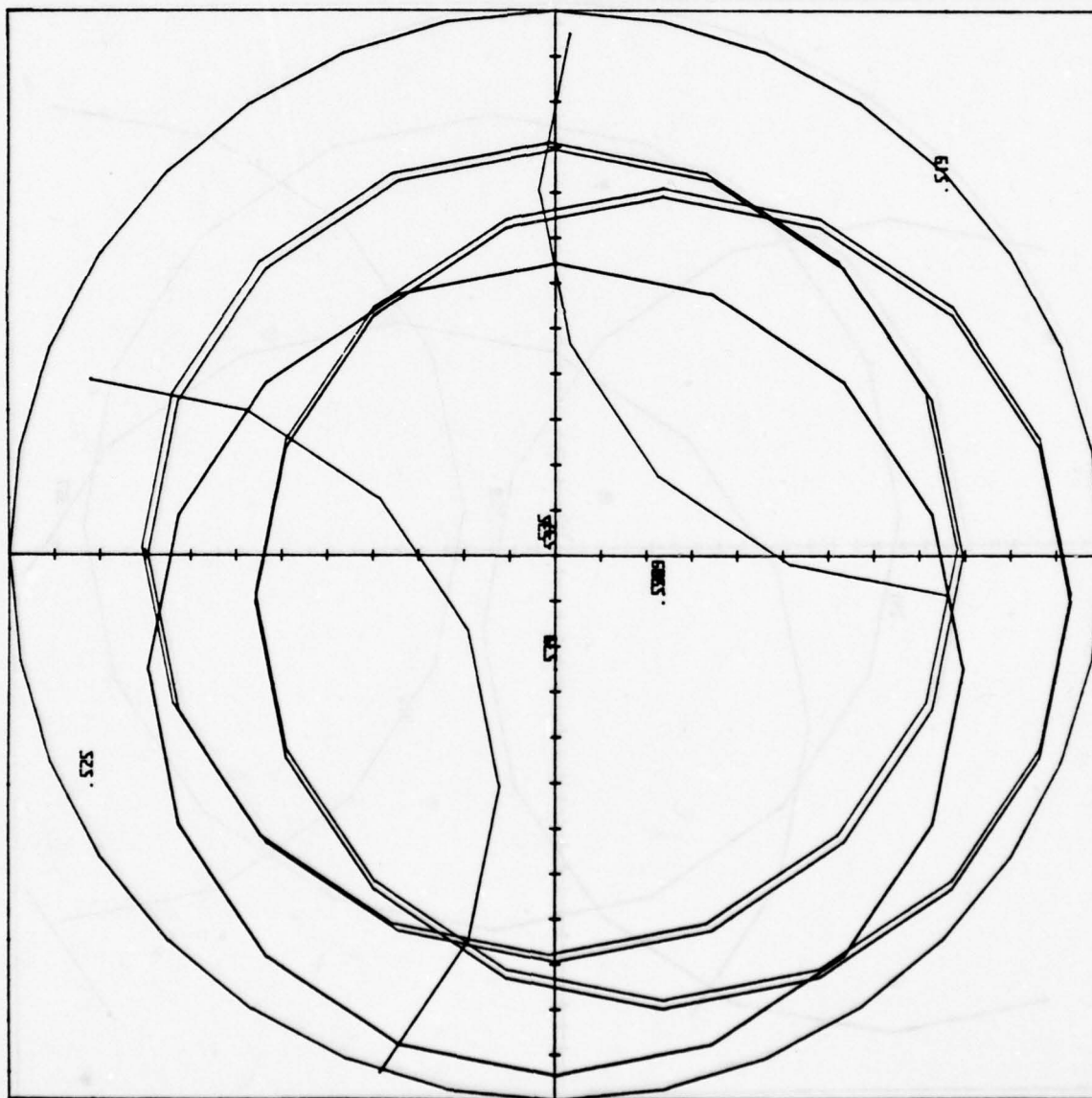




OKC  
OKLAHOMA CITY, OKLAHOMA

IR 1001 0.0  
FILE # 532 USED AS NOMINAL SITE

FILE # 532 USED AS NOMINAL SITE  
 POINT # 519 WITHIN 56.89621321 NM  
 POINT # 520 WITHIN 56.8940962 NM  
 POINT # 521 WITHIN 56.8919817 NM  
 POINT # 522 WITHIN 56.8898672 NM  
 POINT # 523 WITHIN 56.8877527 NM  
 POINT # 524 WITHIN 56.8856382 NM  
 POINT # 525 WITHIN 56.8835237 NM  
 POINT # 526 WITHIN 56.8814092 NM  
 POINT # 527 WITHIN 56.8792947 NM  
 POINT # 528 WITHIN 56.8771802 NM  
 POINT # 529 WITHIN 56.8750657 NM  
 POINT # 530 WITHIN 56.8729512 NM  
 POINT # 531 WITHIN 56.8708367 NM  
 POINT # 532 WITHIN 56.8687222 NM  
 POINT # 533 WITHIN 56.8666077 NM  
 POINT # 534 WITHIN 56.8644932 NM  
 POINT # 535 WITHIN 56.8623787 NM

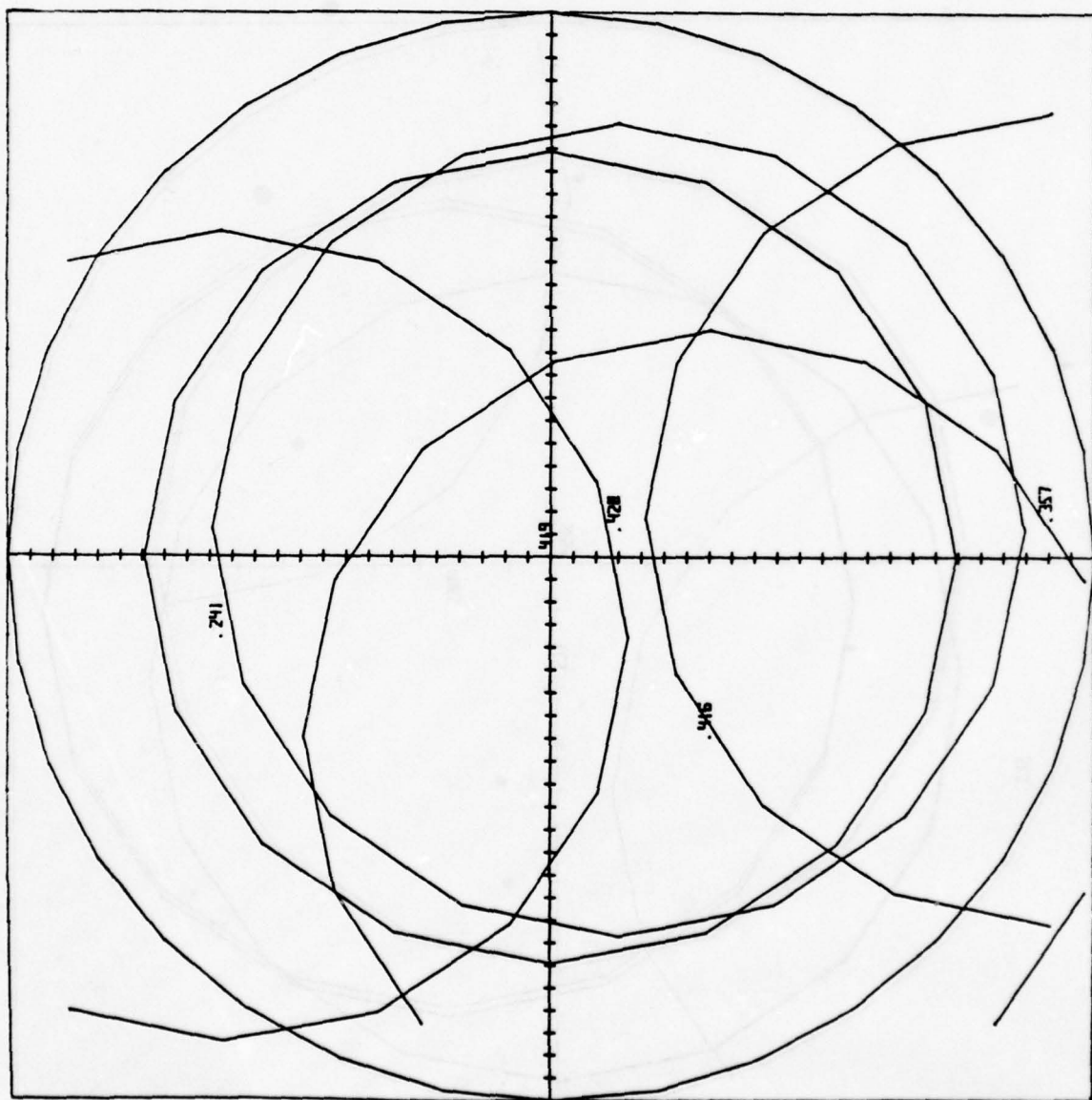




0 M A

OMAHA, NEB.

1000 4000 6175 10000 29.4427  
 1000 4000 6175 10000 120  
 11 # 419 USED AS INITIAL SITE  
 1000 # 241 10000 74.40000005  
 1000 # 357 10000 110.0451 10  
 1000 # 416 10000 52.00000000  
 1000 # 419 10000 0 100  
 1000 # 420 10000 15.26000000  
 ... 10000 10000 10000 10000



D-114



OMA

OMAHA, NEB.

LOUT 1800 GIVES POINTS 44.72135  
CE OF REED PHOTOS. DIR 70

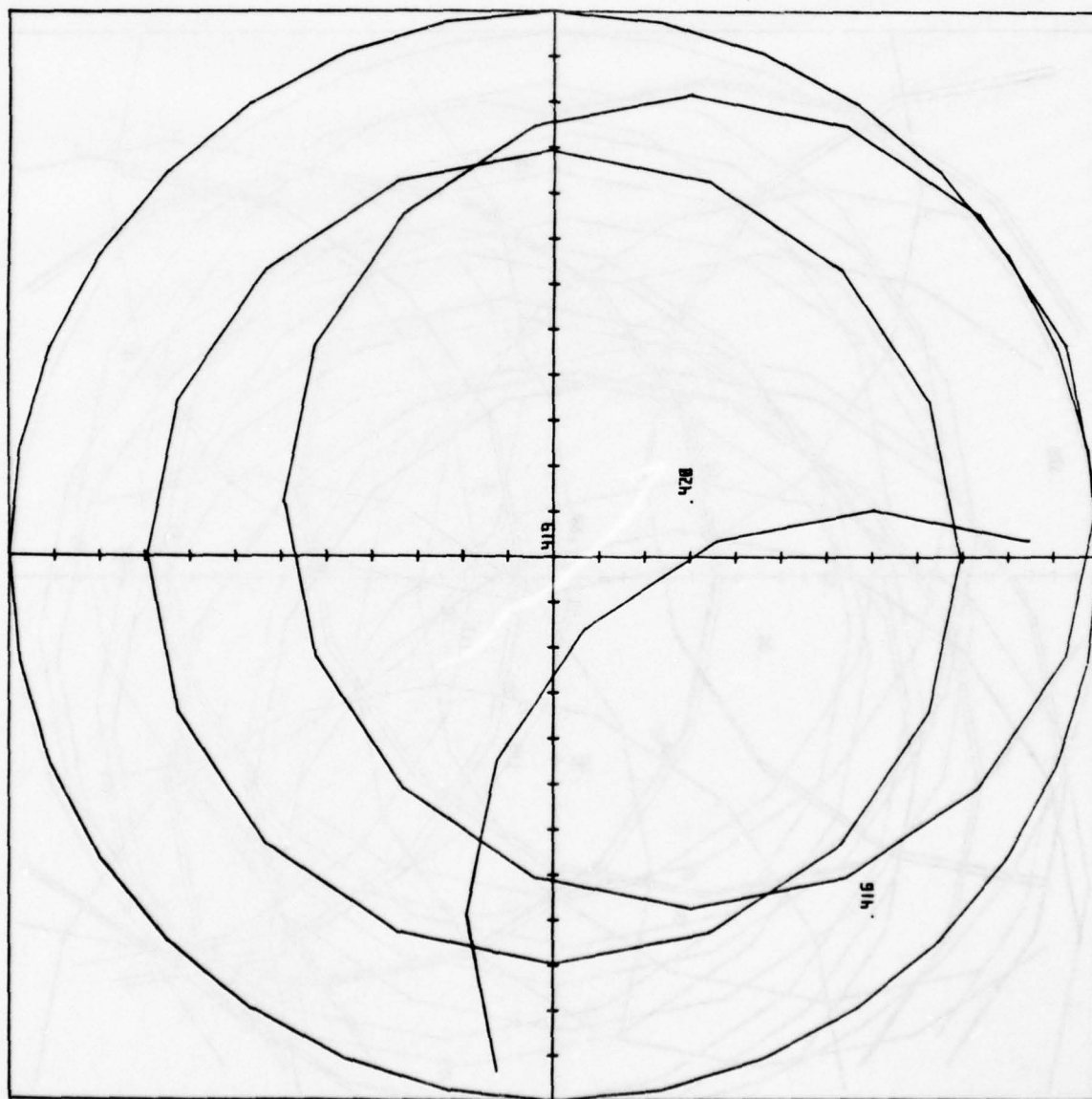
E # 419 USED AS HORIZONTAL SITE

GROUP # 416 WITHIN 52.88285842

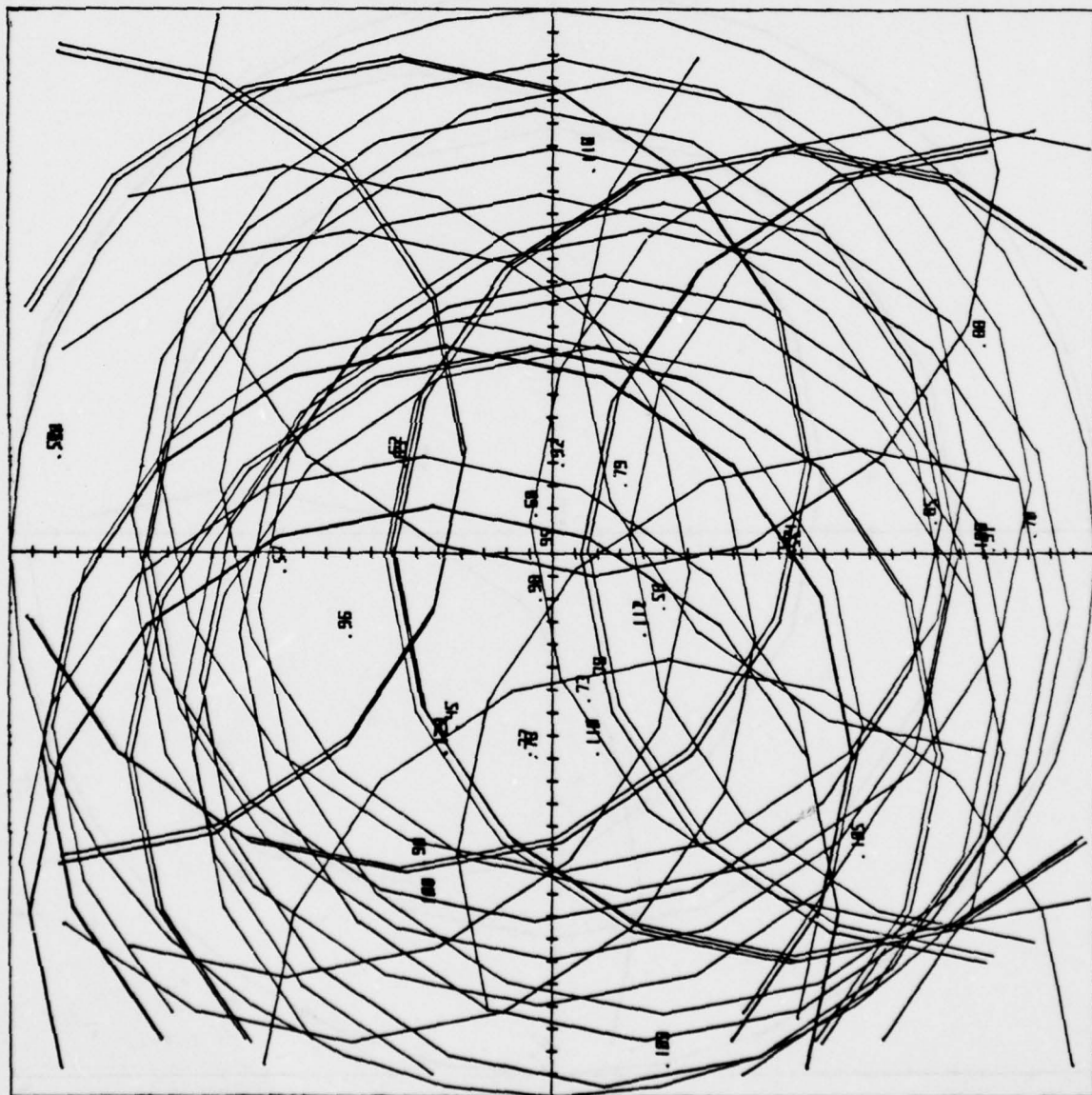
GROUP # 419 WITHIN 6 NM

GROUP # 420 WITHIN 16.2689295

OR \*\*\*\*\* \*\*\*\*\* \*\*\*\*\*







ONT  
ONTARIO, CALIF.  
RIVERSIDE, CALIF.

HEIGHT 4000  
SIZE OF AREA (RADIUS 100) 120

FILE # 95 USED AS NOMINAL SITE

PHASE # 45	WITHIN 43.45127468	NR
PHASE # 50	WITHIN 110.933	NR
PHASE # 51	WITHIN 111.0452137	NR
PHASE # 52	WITHIN 111.0452137	NR
PHASE # 54	WITHIN 53.71634720	NR
PHASE # 55	WITHIN 54.56569368	NR
PHASE # 56	WITHIN 52.40611767	NR
PHASE # 57	WITHIN 59.40842325	NR
PHASE # 58	WITHIN 27.348883	NR
PHASE # 59	WITHIN 9.160534566	NR
PHASE # 60	WITHIN 9.160534566	NR
PHASE # 62	WITHIN 39.24189491	NR
PHASE # 63	WITHIN 37.70005388	NR
PHASE # 64	WITHIN 37.70005388	NR
PHASE # 70	WITHIN 100.6026358	NR
PHASE # 73	WITHIN 33.17320950	NR
PHASE # 74	WITHIN 30.44822418	NR
PHASE # 75	WITHIN 30.44822418	NR
PHASE # 76	WITHIN 44.75979493	NR
PHASE # 77	WITHIN 44.75979493	NR
PHASE # 79	WITHIN 22.1707374	NR
PHASE # 85	WITHIN 84.77224407	NR
PHASE # 88	WITHIN 105.8331679	NR
PHASE # 90	WITHIN 75.75141123	NR
PHASE # 91	WITHIN 75.75141123	NR
PHASE # 92	WITHIN 75.75141123	NR
PHASE # 95	WITHIN 19.6762458	NR
PHASE # 96	WITHIN 0	NR
PHASE # 98	WITHIN 40.3481357	NR
PHASE # 99	WITHIN 10.57871549	NR
PHASE # 100	WITHIN 33.17645461	NR
PHASE # 101	WITHIN 33.17645461	NR
PHASE # 105	WITHIN 95.40842325	NR
PHASE # 106	WITHIN 95.40842325	NR
PHASE # 107	WITHIN 95.40842325	NR
PHASE # 108	WITHIN 95.40842325	NR
PHASE # 109	WITHIN 115.6814971	NR
PHASE # 110	WITHIN 44.75979493	NR
PHASE # 111	WITHIN 75.75141123	NR
PHASE # 112	WITHIN 75.75141123	NR
PHASE # 116	WITHIN 95.40842325	NR
PHASE # 117	WITHIN 95.40842325	NR
PHASE # 123	WITHIN 49.42663464	NR
PHASE # 124	WITHIN 49.42663464	NR
PHASE # 125	WITHIN 49.42663464	NR
PHASE # 126	WITHIN 49.42663464	NR
PHASE # 127	WITHIN 49.42663464	NR
PHASE # 128	WITHIN 49.42663464	NR
PHASE # 129	WITHIN 49.42663464	NR
PHASE # 130	WITHIN 49.42663464	NR
PHASE # 131	WITHIN 49.42663464	NR
PHASE # 132	WITHIN 49.42663464	NR
PHASE # 133	WITHIN 49.42663464	NR
PHASE # 134	WITHIN 49.42663464	NR
PHASE # 135	WITHIN 49.42663464	NR
PHASE # 136	WITHIN 49.42663464	NR
PHASE # 137	WITHIN 49.42663464	NR
PHASE # 138	WITHIN 49.42663464	NR
PHASE # 139	WITHIN 49.42663464	NR
PHASE # 140	WITHIN 49.42663464	NR
PHASE # 141	WITHIN 49.42663464	NR
PHASE # 142	WITHIN 49.42663464	NR
PHASE # 143	WITHIN 49.42663464	NR
PHASE # 144	WITHIN 49.42663464	NR
PHASE # 145	WITHIN 49.42663464	NR
PHASE # 146	WITHIN 49.42663464	NR
PHASE # 147	WITHIN 49.42663464	NR
PHASE # 148	WITHIN 49.42663464	NR
PHASE # 149	WITHIN 49.42663464	NR
PHASE # 150	WITHIN 49.42663464	NR
PHASE # 151	WITHIN 49.42663464	NR
PHASE # 152	WITHIN 49.42663464	NR
PHASE # 153	WITHIN 49.42663464	NR
PHASE # 154	WITHIN 49.42663464	NR
PHASE # 155	WITHIN 49.42663464	NR
PHASE # 156	WITHIN 49.42663464	NR
PHASE # 157	WITHIN 49.42663464	NR
PHASE # 158	WITHIN 49.42663464	NR
PHASE # 159	WITHIN 49.42663464	NR
PHASE # 160	WITHIN 49.42663464	NR
PHASE # 161	WITHIN 49.42663464	NR
PHASE # 162	WITHIN 49.42663464	NR
PHASE # 163	WITHIN 49.42663464	NR
PHASE # 164	WITHIN 49.42663464	NR
PHASE # 165	WITHIN 49.42663464	NR
PHASE # 166	WITHIN 49.42663464	NR
PHASE # 167	WITHIN 49.42663464	NR
PHASE # 168	WITHIN 49.42663464	NR
PHASE # 169	WITHIN 49.42663464	NR
PHASE # 170	WITHIN 49.42663464	NR
PHASE # 171	WITHIN 49.42663464	NR
PHASE # 172	WITHIN 49.42663464	NR
PHASE # 173	WITHIN 49.42663464	NR
PHASE # 174	WITHIN 49.42663464	NR
PHASE # 175	WITHIN 49.42663464	NR
PHASE # 176	WITHIN 49.42663464	NR
PHASE # 177	WITHIN 49.42663464	NR
PHASE # 178	WITHIN 49.42663464	NR
PHASE # 179	WITHIN 49.42663464	NR
PHASE # 180	WITHIN 49.42663464	NR
PHASE # 181	WITHIN 49.42663464	NR
PHASE # 182	WITHIN 49.42663464	NR
PHASE # 183	WITHIN 49.42663464	NR
PHASE # 184	WITHIN 49.42663464	NR
PHASE # 185	WITHIN 49.42663464	NR
PHASE # 186	WITHIN 49.42663464	NR
PHASE # 187	WITHIN 49.42663464	NR
PHASE # 188	WITHIN 49.42663464	NR
PHASE # 189	WITHIN 49.42663464	NR
PHASE # 190	WITHIN 49.42663464	NR
PHASE # 191	WITHIN 49.42663464	NR
PHASE # 192	WITHIN 49.42663464	NR
PHASE # 193	WITHIN 49.42663464	NR
PHASE # 194	WITHIN 49.42663464	NR
PHASE # 195	WITHIN 49.42663464	NR
PHASE # 196	WITHIN 49.42663464	NR
PHASE # 197	WITHIN 49.42663464	NR
PHASE # 198	WITHIN 49.42663464	NR
PHASE # 199	WITHIN 49.42663464	NR
PHASE # 200	WITHIN 49.42663464	NR



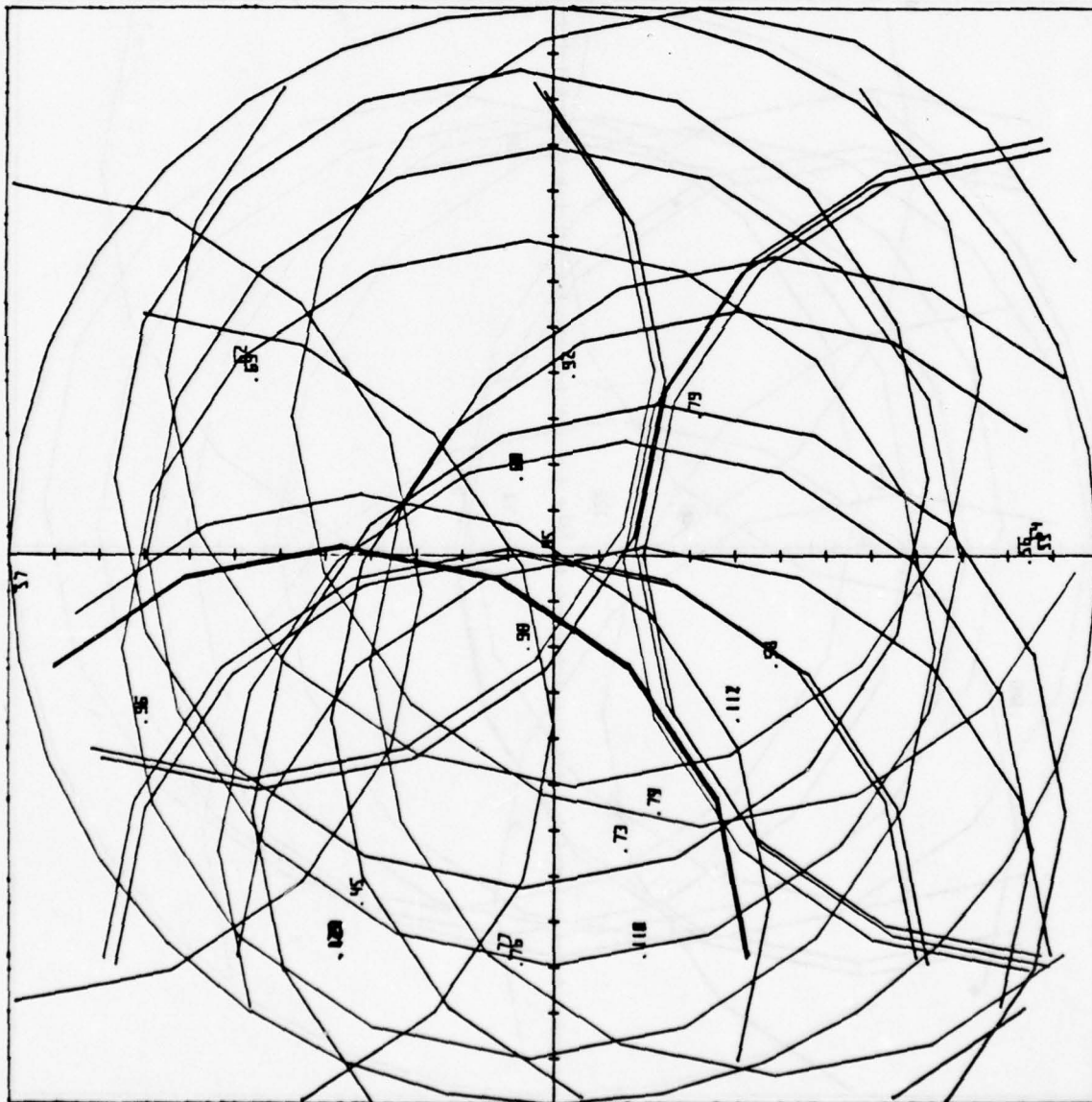
ONT

ONTARIO, CALIF.  
RIVERSIDE, CALIF.

BLIGHT 1000 GIVES PHOTOS 44.7-135955  
SIZE OF AREA PHOTOS 100' 50'

FILE # 95 USED AS INITIAL SITE

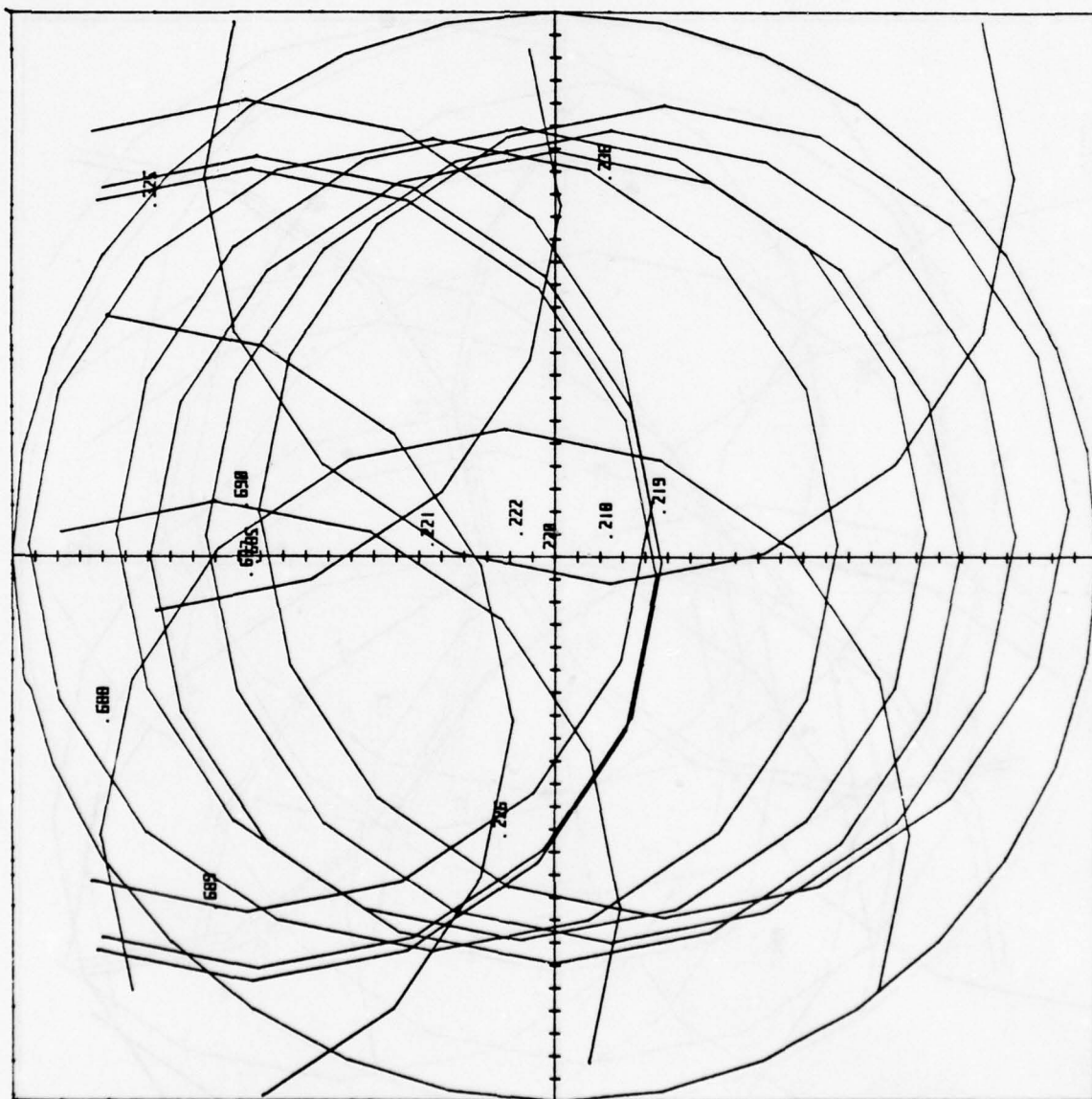
Photo # 45	WITHIN 43.45127468
Photo # 54	WITHIN 53.71634720
Photo # 55	WITHIN 54.58969368
Photo # 56	WITHIN 52.40611767
Photo # 57	WITHIN 59.40847325
Photo # 58	WITHIN 57.348883
Photo # 59	WITHIN 9.160534566
Photo # 60	WITHIN 9.160534566
Photo # 62	WITHIN 39.24187931
Photo # 63	WITHIN 37.70005388
Photo # 64	WITHIN 33.17372095
Photo # 73	WITHIN 30.44922418
Photo # 74	WITHIN 30.44922418
Photo # 75	WITHIN 44.75928993
Photo # 76	WITHIN 44.75928993
Photo # 77	WITHIN 44.75928993
Photo # 78	WITHIN 44.75928993
Photo # 79	WITHIN 44.75928993
Photo # 80	WITHIN 44.75928993
Photo # 81	WITHIN 44.75928993
Photo # 82	WITHIN 44.75928993
Photo # 83	WITHIN 44.75928993
Photo # 84	WITHIN 44.75928993
Photo # 85	WITHIN 44.75928993
Photo # 86	WITHIN 44.75928993
Photo # 87	WITHIN 44.75928993
Photo # 88	WITHIN 44.75928993
Photo # 89	WITHIN 44.75928993
Photo # 90	WITHIN 44.75928993
Photo # 91	WITHIN 44.75928993
Photo # 92	WITHIN 44.75928993
Photo # 93	WITHIN 44.75928993
Photo # 94	WITHIN 44.75928993
Photo # 95	WITHIN 44.75928993
Photo # 96	WITHIN 44.75928993
Photo # 97	WITHIN 44.75928993
Photo # 98	WITHIN 44.75928993
Photo # 99	WITHIN 44.75928993
Photo # 100	WITHIN 44.75928993
Photo # 101	WITHIN 44.75928993
Photo # 102	WITHIN 44.75928993
Photo # 103	WITHIN 44.75928993
Photo # 104	WITHIN 44.75928993
Photo # 105	WITHIN 44.75928993
Photo # 106	WITHIN 44.75928993
Photo # 107	WITHIN 44.75928993
Photo # 108	WITHIN 44.75928993
Photo # 109	WITHIN 44.75928993
Photo # 110	WITHIN 44.75928993
Photo # 111	WITHIN 44.75928993
Photo # 112	WITHIN 44.75928993
Photo # 113	WITHIN 44.75928993
Photo # 114	WITHIN 44.75928993
Photo # 115	WITHIN 44.75928993
Photo # 116	WITHIN 44.75928993
Photo # 117	WITHIN 44.75928993
Photo # 118	WITHIN 44.75928993
Photo # 119	WITHIN 44.75928993
Photo # 120	WITHIN 44.75928993
Photo # 121	WITHIN 44.75928993
Photo # 122	WITHIN 44.75928993
Photo # 123	WITHIN 44.75928993
Photo # 124	WITHIN 44.75928993
Photo # 125	WITHIN 44.75928993





ORD

CHICAGO O'HARE, ILL.



LIGHT 4000 GIVES RADIOS 89.442719  
 CE OF AREA RADIOS 120  
 LE # 220 USED AS HORIZONTAL SITE  
 PHOP # 218 WITHIN 13.18282779 NO  
 PHOP # 219 WITHIN 26.15562449 NO  
 PHOP # 220 WITHIN 0 NM  
 PHOP # 221 WITHIN 27.09324537 NO  
 PHOP # 222 WITHIN 9.052936134 NO  
 PHOP # 223 WITHIN 52.22786884 NO  
 PHOP # 224 WITHIN 84.87833536 NO  
 PHOP # 225 WITHIN 117.474143 NO  
 PHOP # 226 WITHIN 65.81178424 NO  
 PHOP # 227 WITHIN 67.1104014 NO  
 PHOP # 228 WITHIN 105.2957134 NO  
 PHOP # 229 WITHIN 107.615016 NO  
 PHOP # 230 WITHIN 67.03507464 NO  
 ..... \*\*\*\*\*







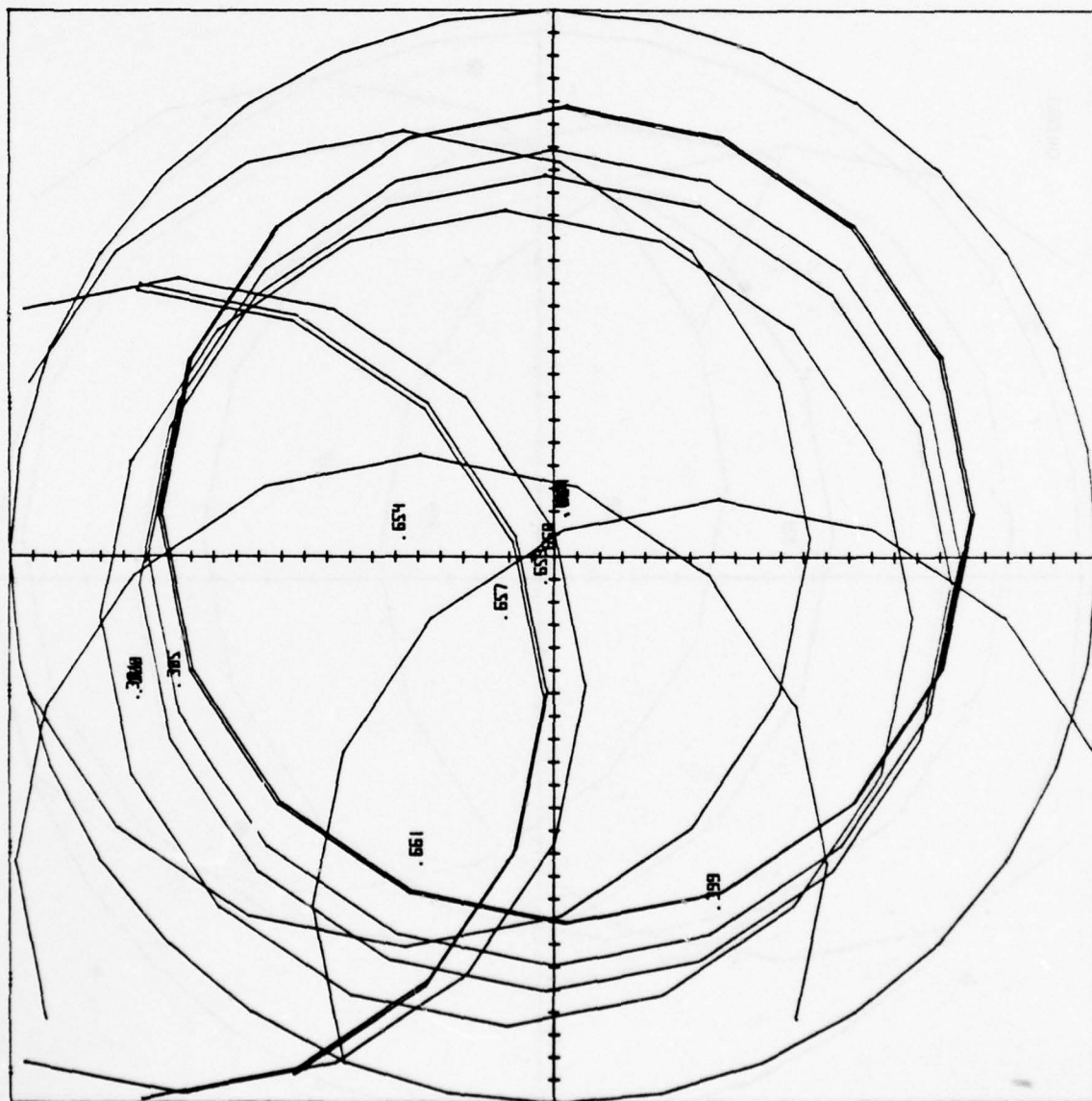
ORF

NORFOLK, VA.

1000 4000 CIVILS PHOTOS 89.44.219  
 L.E. OF HELA PHOTOS 100 120

FILE # 658 USED AS NORMAL SITE

PHOTO # 300	WITHIN 96.67806486	H
PHOTO # 301	WITHIN 96.70218583	I
PHOTO # 302	WITHIN 97.08855044	I
PHOTO # 303	WITHIN 97.1929741	I
PHOTO # 304	WITHIN 97.54313611	I
PHOTO # 305	WITHIN 16.90148124	I
PHOTO # 306	WITHIN 0.000	I
PHOTO # 307	WITHIN 5.821307362	I
PHOTO # 308	WITHIN 7.20605945	I
PHOTO # 309	WITHIN 9.54313611	I
PHOTO # 310	WITHIN 10.0493767	I

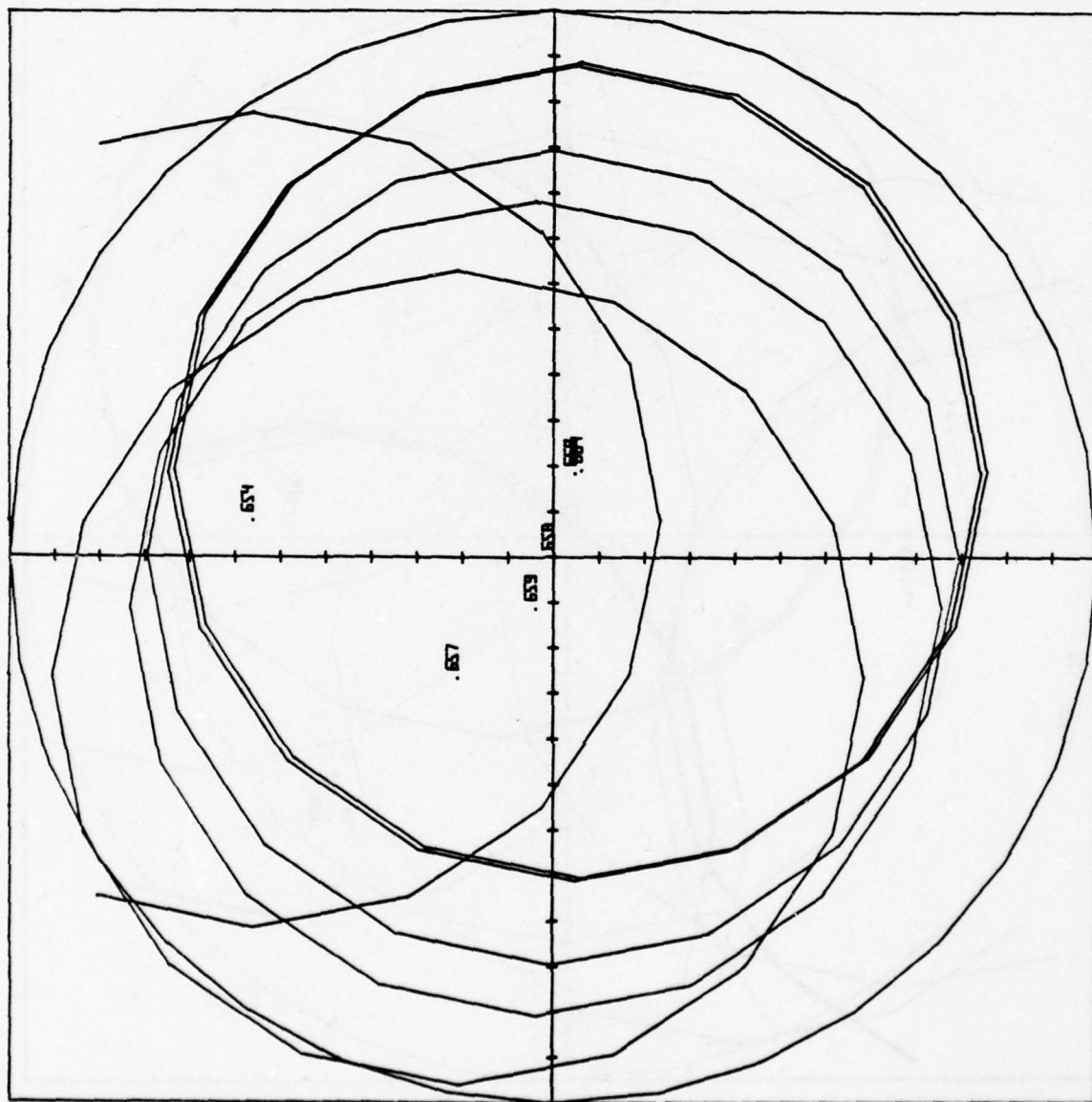


D-120



ORF

NORFOLK, VA.



1000 1000 CIRCLES FIDUCIAL 44.7212  
 21 OF OPEN FIDUCIAL 40 60

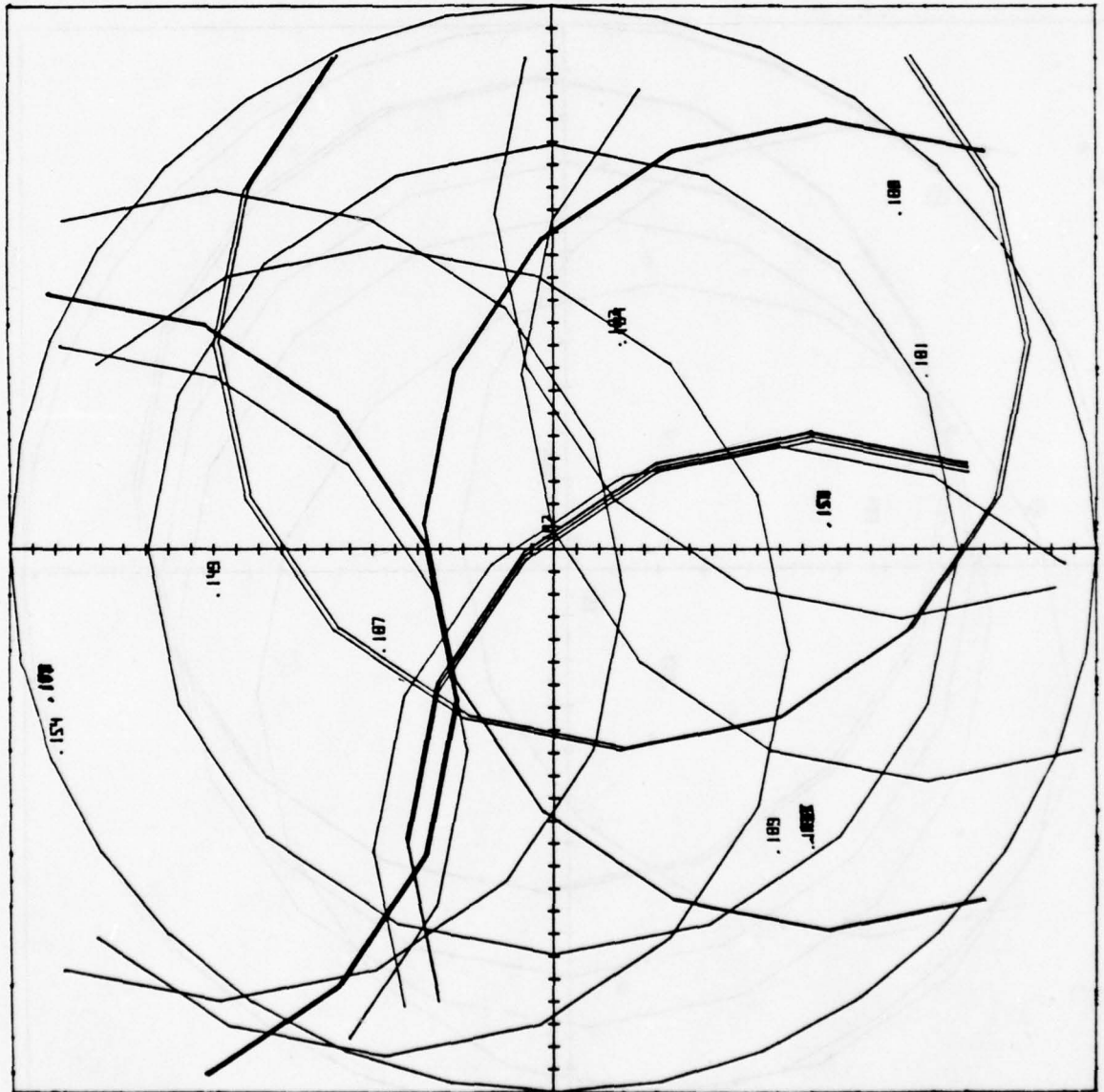
FILE # 658 USED AS MONITOR SITE

FILE # 654 WITHIN 2.129741  
 FILE # 656 WITHIN 2.5412411  
 FILE # 657 WITHIN 16.9014124  
 FILE # 658 WITHIN 0 HM  
 FILE # 659 WITHIN 5.421407362  
 FILE # 661 WITHIN 2.5412411  
 FILE # 664 WITHIN 10.0092167  
 \*\*\* \*\*\*\*\*



ORL

ORLANDO, FLORIDA



D-122

1. 1501-4000 5175 PHOTOS 89.4427191  
1.2. OF DECH PHOTOS 100.120

ILL # 182 USED AS BATHING SITE

PHOTO # 149	WITHIN 74.48408773	00
PHOTO # 150	WITHIN 60.95008926	00
PHOTO # 151	WITHIN 60.95008926	00
PHOTO # 152	WITHIN 61.25102803	00
PHOTO # 154	WITHIN 117.0105047	00
PHOTO # 164	WITHIN 116.0210033	00
PHOTO # 170	WITHIN 115.6252334	00
PHOTO # 171	WITHIN 115.4159927	00
PHOTO # 175	WITHIN 85.30504082	00
PHOTO # 176	WITHIN 86.92784449	00
PHOTO # 177	WITHIN 85.30504082	00
PHOTO # 180	WITHIN 100.0000000	00
PHOTO # 181	WITHIN 90.0000000	00
PHOTO # 182	WITHIN 0	00
PHOTO # 183	WITHIN 47.5900000	00
PHOTO # 184	WITHIN 48.4000000	00
PHOTO # 185	WITHIN 47.5900000	00
PHOTO # 186	WITHIN 48.4000000	00
PHOTO # 187	WITHIN 47.5900000	00
PHOTO # 188	WITHIN 48.4000000	00



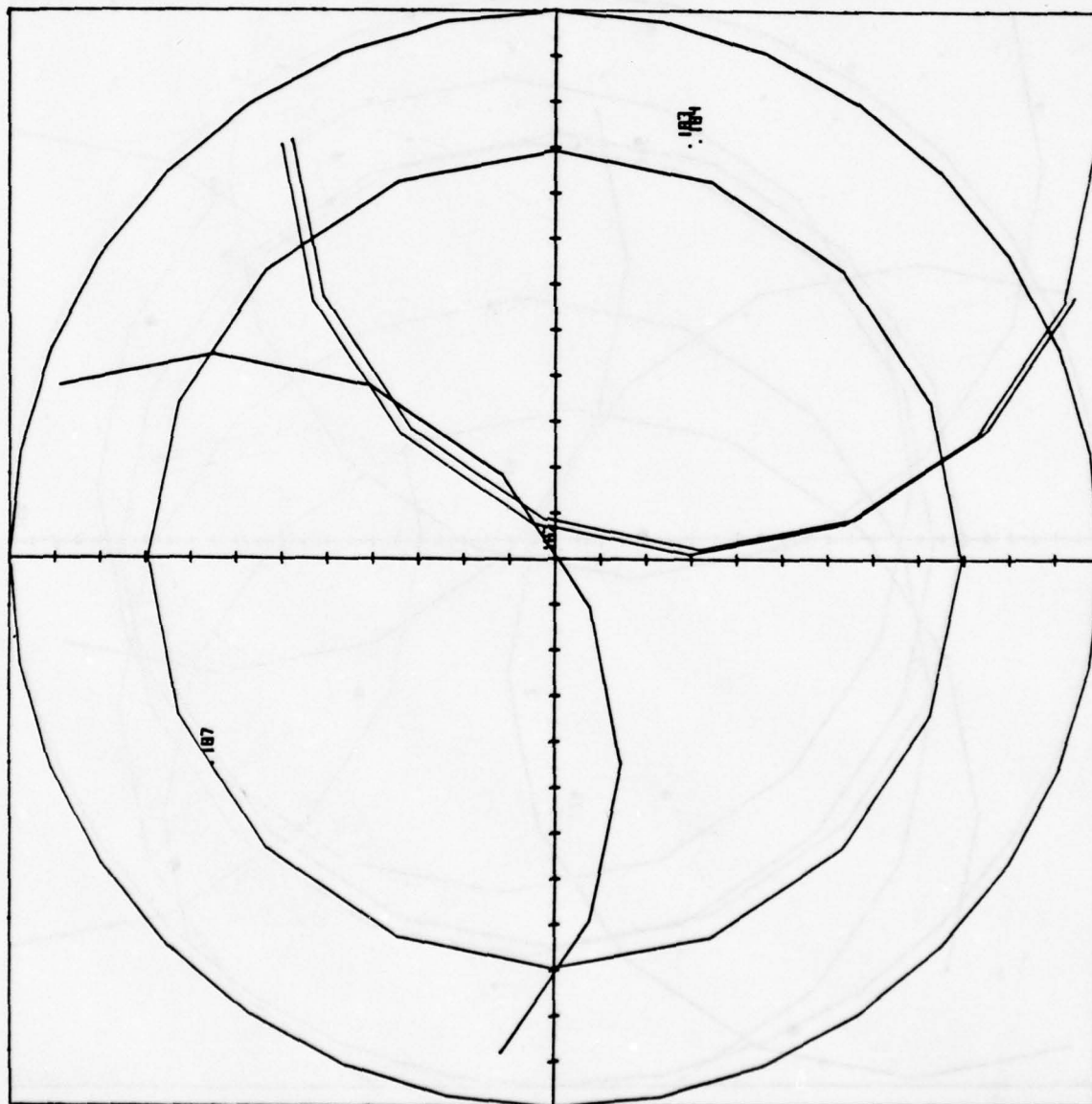
O R L

ORLANDO, FLORIDA

DATE 1009 GIVES PHOTOS 44.021 55  
L OF AREA PHOTOS 000.000

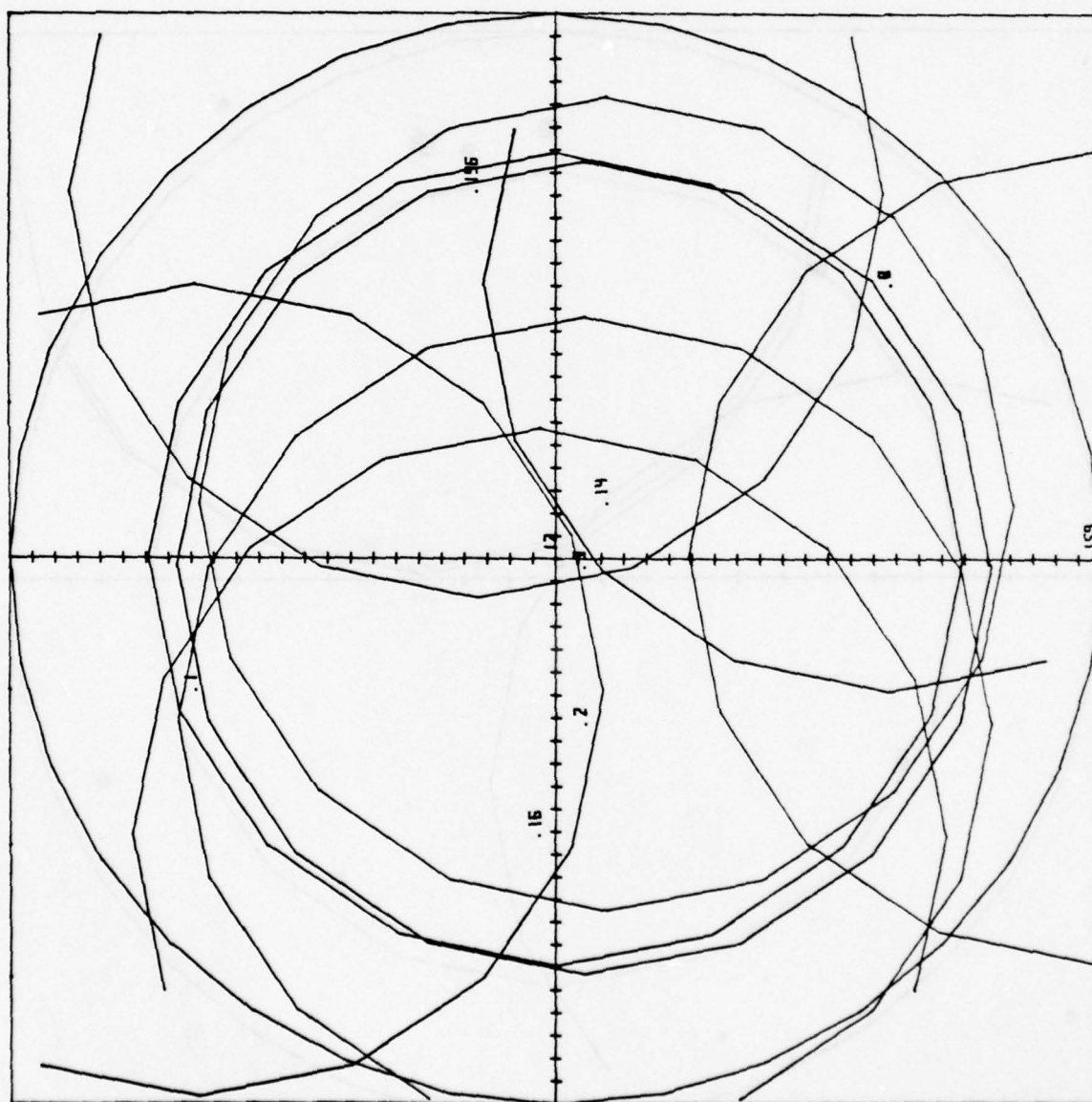
IL # 182 USED AS INITIAL SITE

PHOTO # 182 WITHIN 0.000  
PHOTO # 183 WITHIN 47.5007745  
PHOTO # 184 WITHIN 48.4803534  
PHOTO # 187 WITHIN 43.6283216  
\*\*\* \*\*\*\*\*





**FT. RUCKER, ALABAMA**

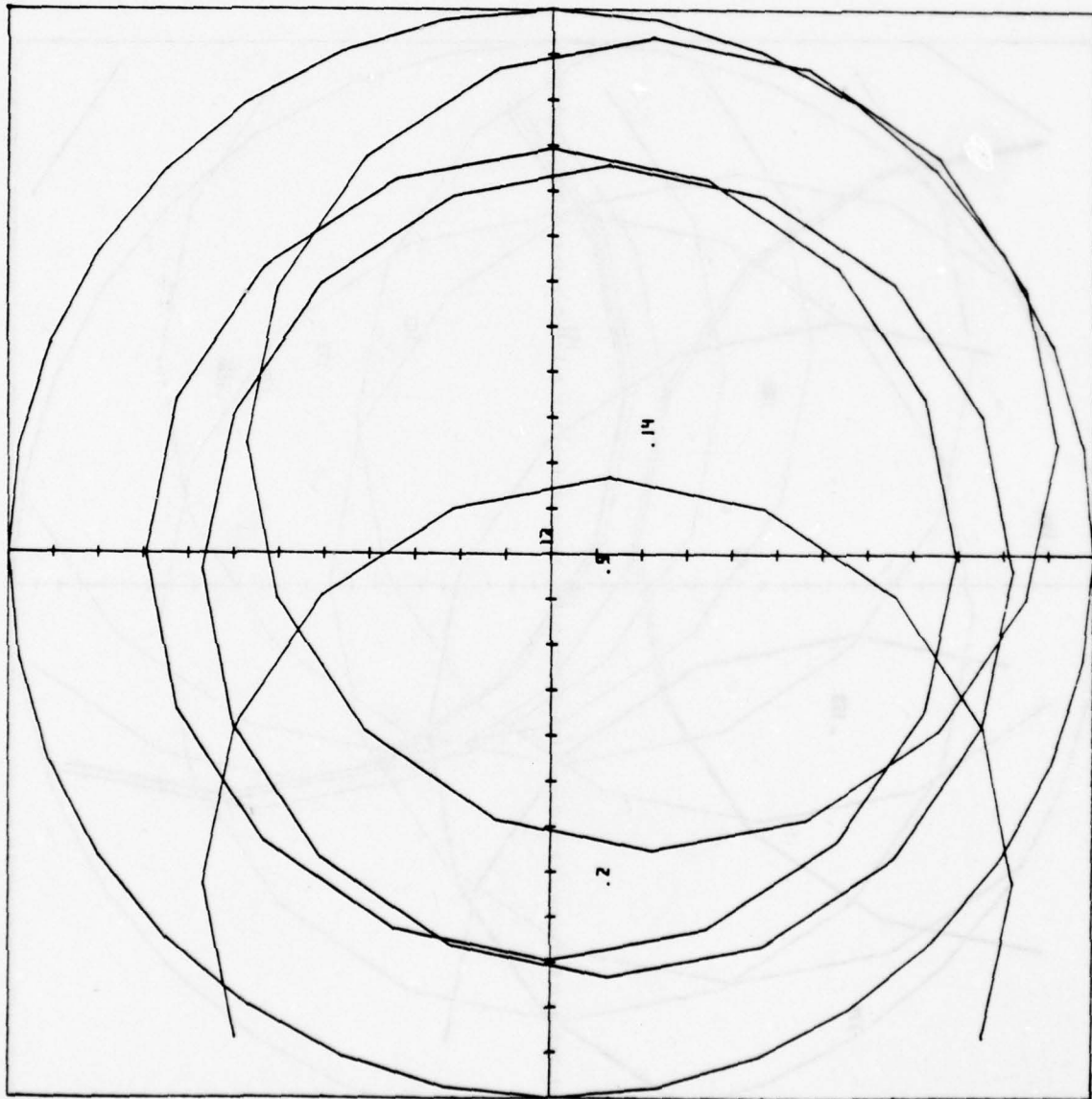


LEIGH 4000 CL OF MEM	GIVES PRIORITY 89 44271	PROBING 000 120	0-CLD HS 0000000 SITE
Group # 1	WITHIN 34.33471083		
Endcap # 2	WITHIN 36.30475704		
Group # 3	WITHIN 37.54081185		
Endcap # 5	WITHIN 37.54081186		
Group # 6	WITHIN 38.00071000		
Endcap # 7	WITHIN 38.00071000		
Group # 8	WITHIN 38.16085967		
Endcap # 9	WITHIN 38.16085967		
Group # 12	WITHIN 38.16085967		
Endcap # 13	WITHIN 38.16085967		
Group # 14	WITHIN 38.16085967		
Endcap # 16	WITHIN 38.16085967		
Group # 154	WITHIN 118.76471001		
Endcap # 156	WITHIN 118.76471001		
Group # 156	WITHIN 118.76471001		



02A

FT. RUCKER, ALABAMA



1000 1000 6195 6195 44.721 44.721 554  
 LE OF OPEN 6195 6195 60

LE # 13 USED AS NORMAL SITE

GROUP # 2	WITHIN 36.5445209	10
GROUP # 4	WITHIN 6.540811895	10
GROUP # 5	WITHIN 6.540811895	10
GROUP # 12	WITHIN 0	10
GROUP # 13	WITHIN 0	10
GROUP # 14	WITHIN 16.4750049	10

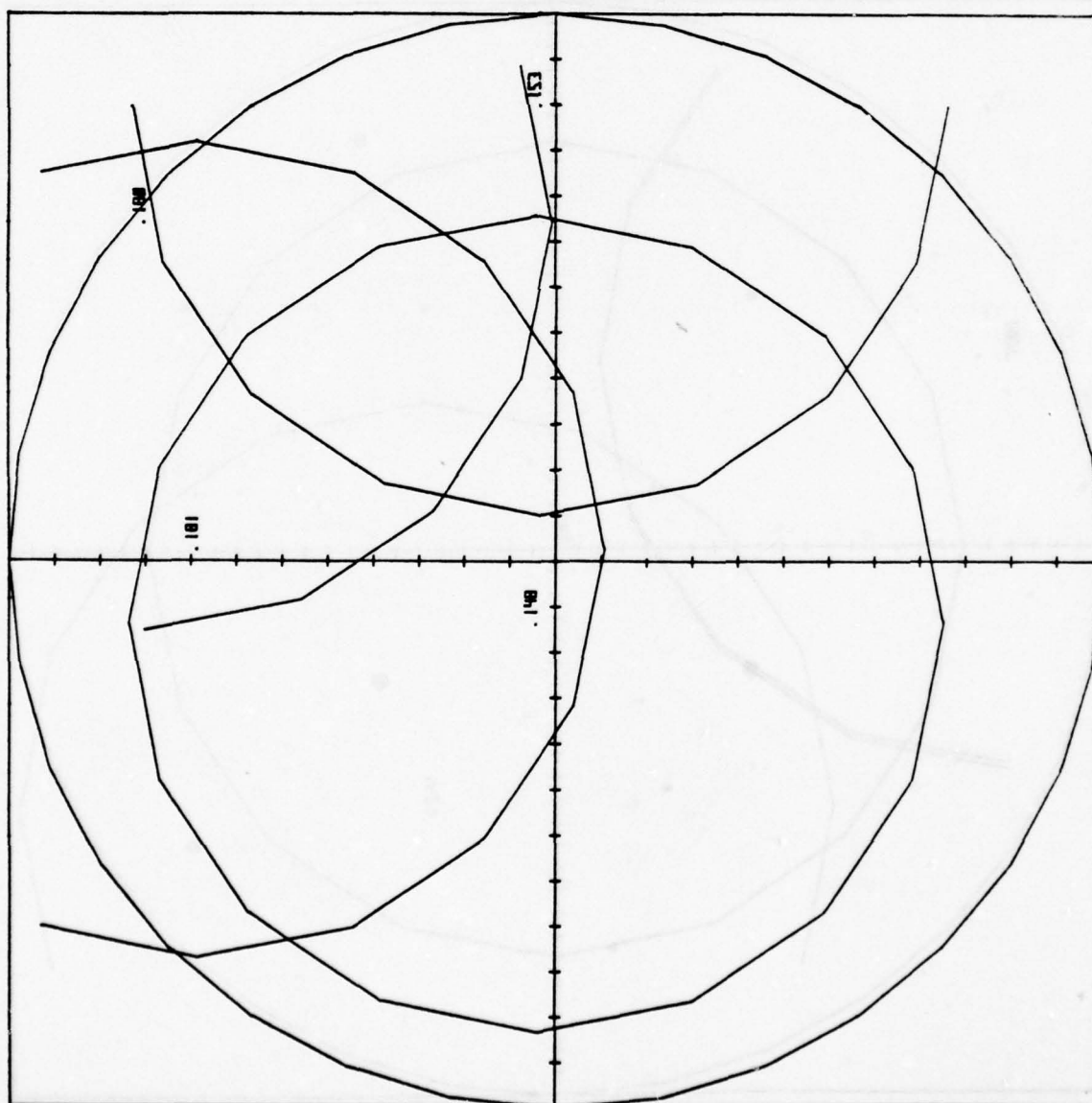


LE NAME-REUSED AS NOMINAL SITE

Female	#	148	RT (min)	7.16	78.10	79
Female	# 150	RT (min)	68.71	67.90		
Female	# 151	RT (min)	68.71	67.90		
Female	# 152	RT (min)	68.71	67.90		
Female	# 153	RT (min)	48.85	60.43		
Female	# 163	RT (min)	48.85	60.43		
Female	# 164	RT (min)	62.01	7.950		
Female	# 165	RT (min)	62.01	7.950		
Female	# 166	RT (min)	62.01	7.950		
Female	# 167	RT (min)	85.79	60.43		
Female	# 175	RT (min)	84.43	51.51		
Female	# 176	RT (min)	113.59	67.15		
Female	# 177	RT (min)	113.59	67.15		
Female	# 178	RT (min)	78.97	67.94		
Female	# 179	RT (min)	78.97	67.94		
Female	# 180	RT (min)	60.43	60.43		
Female	# 181	RT (min)	50.41	67.90		
Female	# 182	RT (min)	39.40	67.90		
Female	# 183	RT (min)	107.37	71.48		
Female	# 184	RT (min)	107.37	71.48		



P B 1  
WEST PALM BEACH, FLA



D-127

PLAT 1000	CLVS	Publ. 44, 721, 355
AL OF DECH	Publ. 44, 721, 355	
PL 1000	113	0-ED 45 000000
PL 140	000000	1.16310039
PL 153	000000	45.80000000
PL 180	000000	56.41800000
PL 181	000000	59.40220000
...	...	...



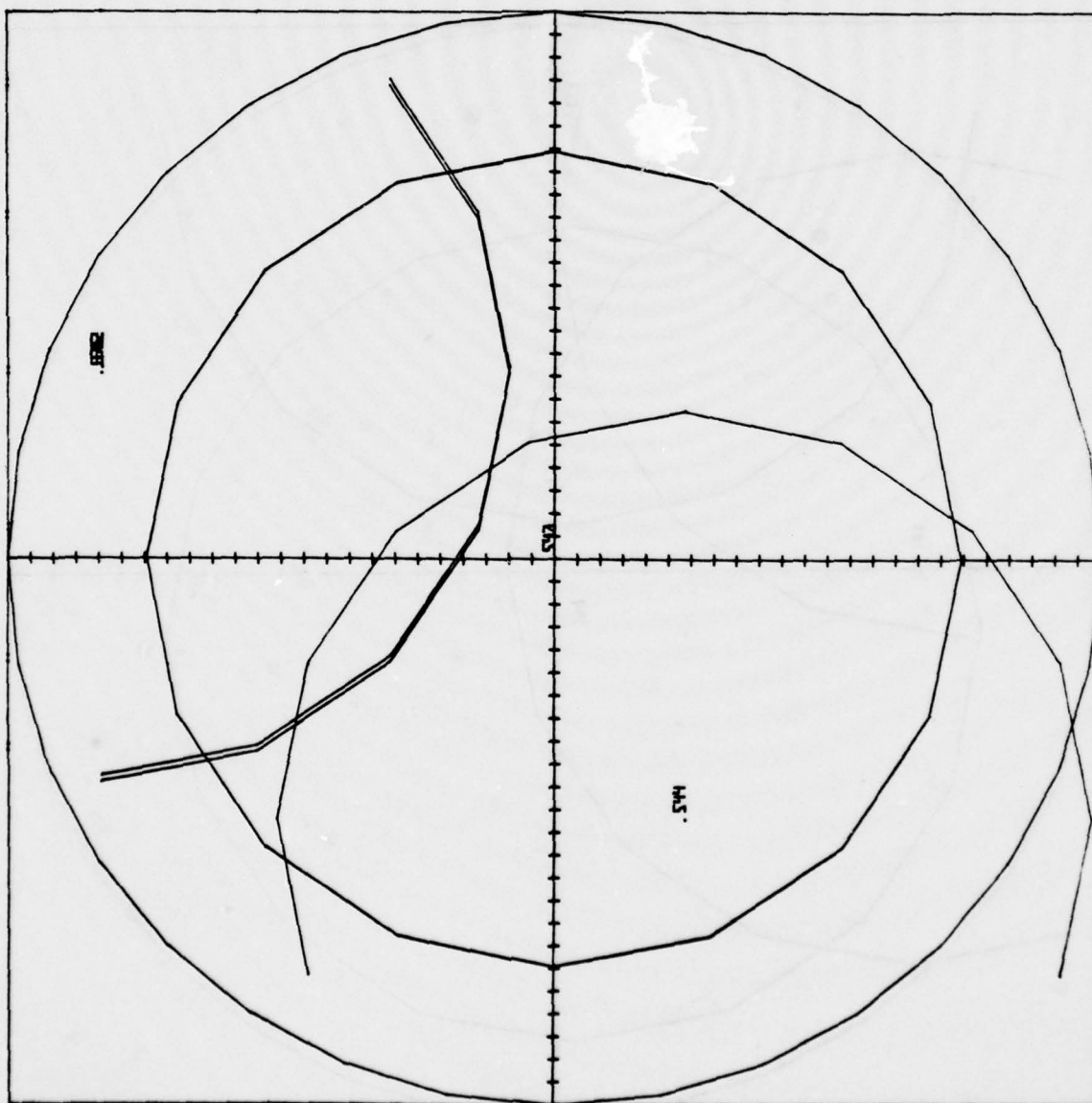
P D X

PORTLAND, OREGON

Light from 6195 18000 09.44.2191  
SE of beam 18000 09.44.2191

LE # 542 USED AS HORIZONTAL SITE

GROUP #	542	WITHIN 0	100
GROUP #	543	WITHIN 0.1701000000	100
GROUP #	544	WITHIN 0.1701000000	100
GROUP #	545	WITHIN 0.1701000000	100
GROUP #	546	WITHIN 0.1701000000	100
GROUP #	547	WITHIN 0.1701000000	100



D-128

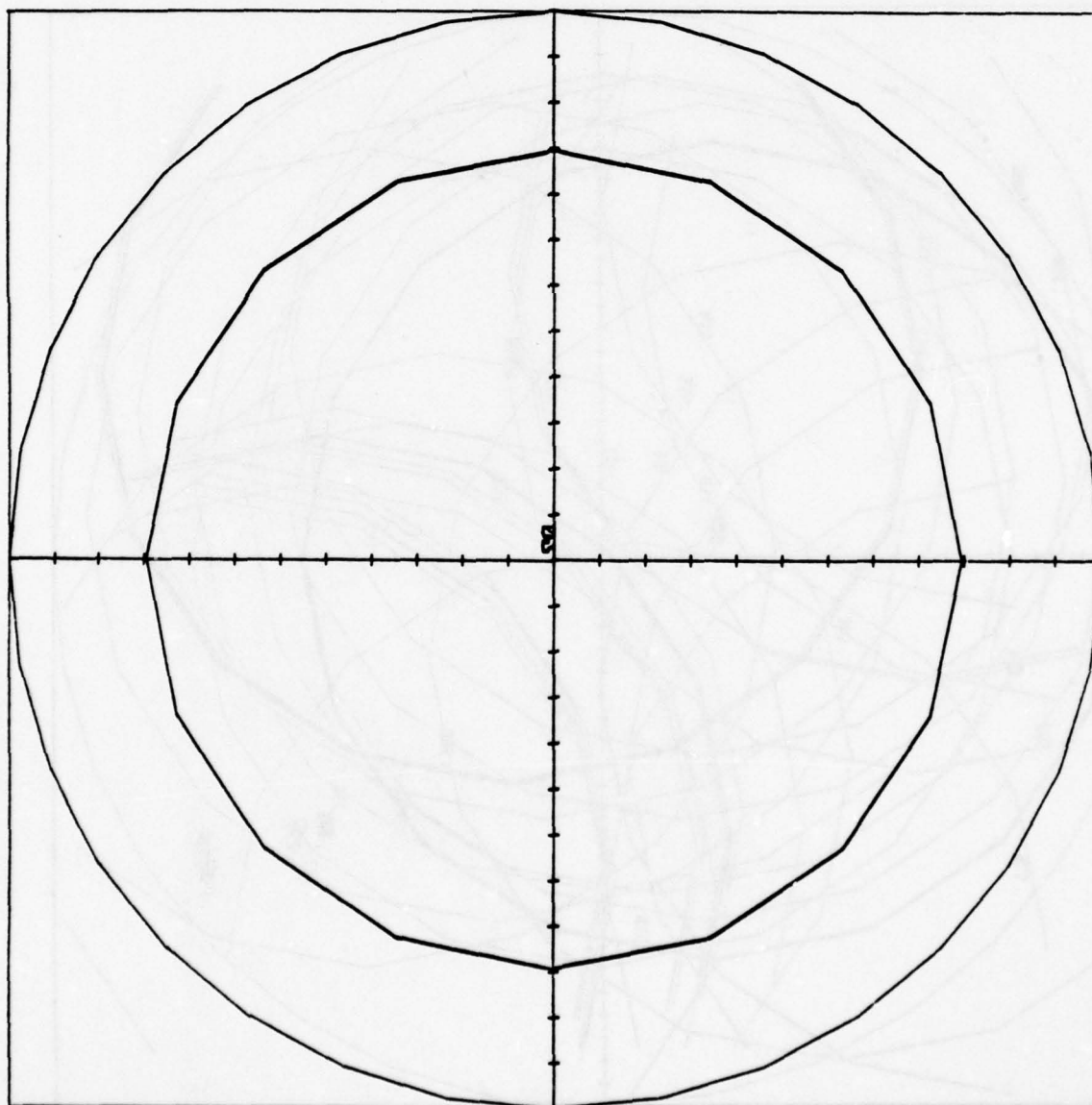


**PORTLAND, OREGON**

U.S. DEPT. OF COMMERCE  
BUREAU OF ECONOMIC ANALYSIS  
WASHINGTON, D. C. 20540

FILE # 542 U.S.D. 05 0011000 51E

\*\*\*\*\*  
89-06101-0 HHHH M 745 # 400H4  
III S HHHH M 275 # 400H4





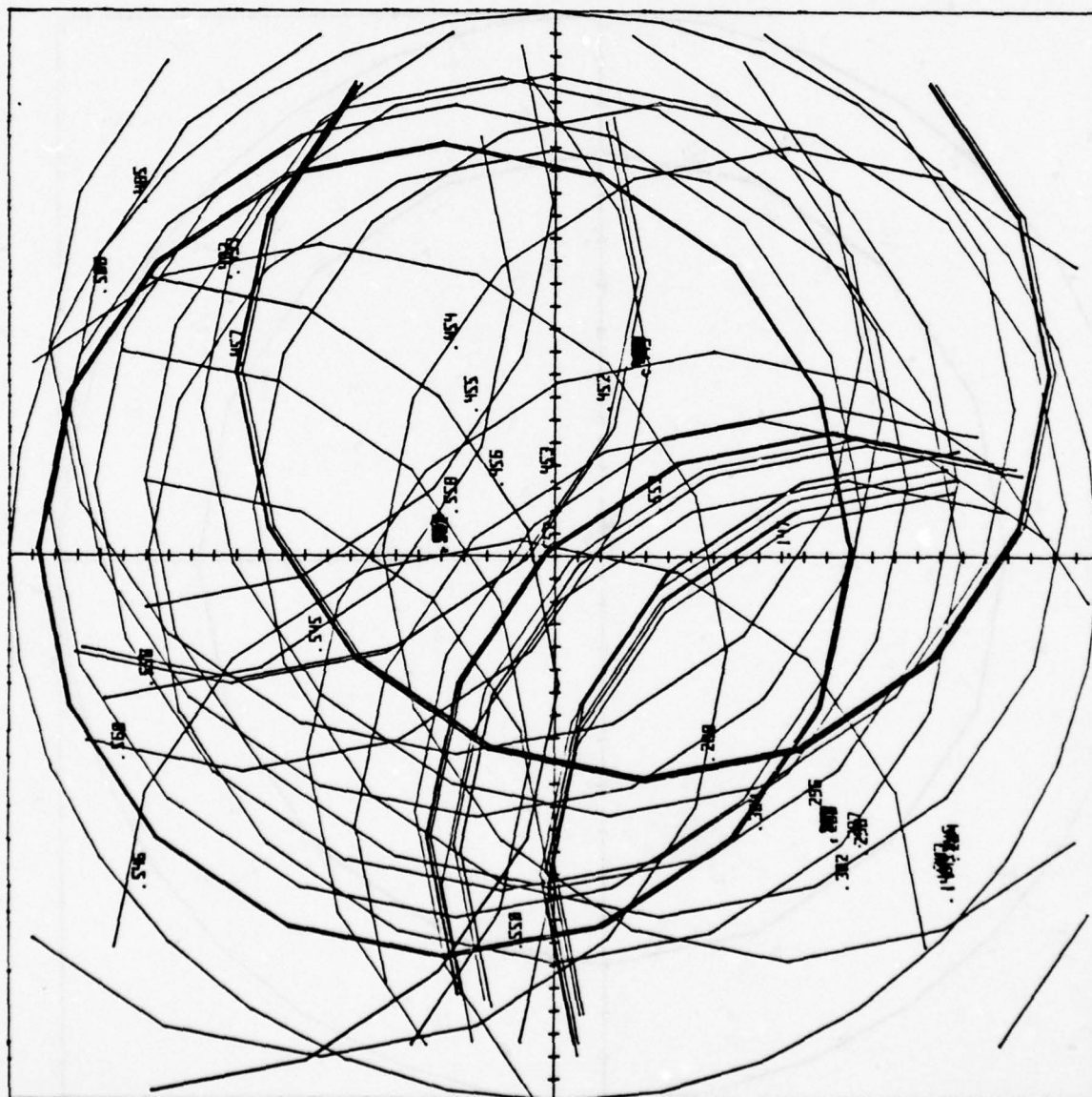
P H L

# PHILADELPHIA, PENN.

BL 1000 4000 GIVES PHOTOS 89.44.27.1910  
SIZE OF AREA PHOTOS 1000 x 120

FILE # 552 USED AS NORMAL SITE

PHOTO # 141	011000 11.404.609	1
PHOTO # 142	011000 11.413.132	1
PHOTO # 143	011000 11.422.011	1
PHOTO # 144	011000 11.431.001	1
PHOTO # 145	011000 11.440.001	1
PHOTO # 146	011000 11.449.001	1
PHOTO # 147	011000 11.458.001	1
PHOTO # 148	011000 11.467.001	1
PHOTO # 149	011000 11.476.001	1
PHOTO # 150	011000 11.485.001	1
PHOTO # 151	011000 11.494.001	1
PHOTO # 152	011000 11.503.001	1
PHOTO # 153	011000 11.512.001	1
PHOTO # 154	011000 11.521.001	1
PHOTO # 155	011000 11.530.001	1
PHOTO # 156	011000 11.539.001	1
PHOTO # 157	011000 11.548.001	1
PHOTO # 158	011000 11.557.001	1
PHOTO # 159	011000 11.566.001	1
PHOTO # 160	011000 11.575.001	1
PHOTO # 161	011000 11.584.001	1
PHOTO # 162	011000 11.593.001	1
PHOTO # 163	011000 11.602.001	1
PHOTO # 164	011000 11.611.001	1
PHOTO # 165	011000 11.620.001	1
PHOTO # 166	011000 11.629.001	1
PHOTO # 167	011000 11.638.001	1
PHOTO # 168	011000 11.647.001	1
PHOTO # 169	011000 11.656.001	1
PHOTO # 170	011000 11.665.001	1
PHOTO # 171	011000 11.674.001	1
PHOTO # 172	011000 11.683.001	1
PHOTO # 173	011000 11.692.001	1
PHOTO # 174	011000 11.701.001	1
PHOTO # 175	011000 11.710.001	1
PHOTO # 176	011000 11.719.001	1
PHOTO # 177	011000 11.728.001	1
PHOTO # 178	011000 11.737.001	1
PHOTO # 179	011000 11.746.001	1
PHOTO # 180	011000 11.755.001	1
PHOTO # 181	011000 11.764.001	1
PHOTO # 182	011000 11.773.001	1
PHOTO # 183	011000 11.782.001	1
PHOTO # 184	011000 11.791.001	1
PHOTO # 185	011000 11.800.001	1
PHOTO # 186	011000 11.809.001	1
PHOTO # 187	011000 11.818.001	1
PHOTO # 188	011000 11.827.001	1
PHOTO # 189	011000 11.836.001	1
PHOTO # 190	011000 11.845.001	1
PHOTO # 191	011000 11.854.001	1
PHOTO # 192	011000 11.863.001	1
PHOTO # 193	011000 11.872.001	1
PHOTO # 194	011000 11.881.001	1
PHOTO # 195	011000 11.890.001	1
PHOTO # 196	011000 11.899.001	1
PHOTO # 197	011000 11.908.001	1
PHOTO # 198	011000 11.917.001	1
PHOTO # 199	011000 11.926.001	1
PHOTO # 200	011000 11.935.001	1

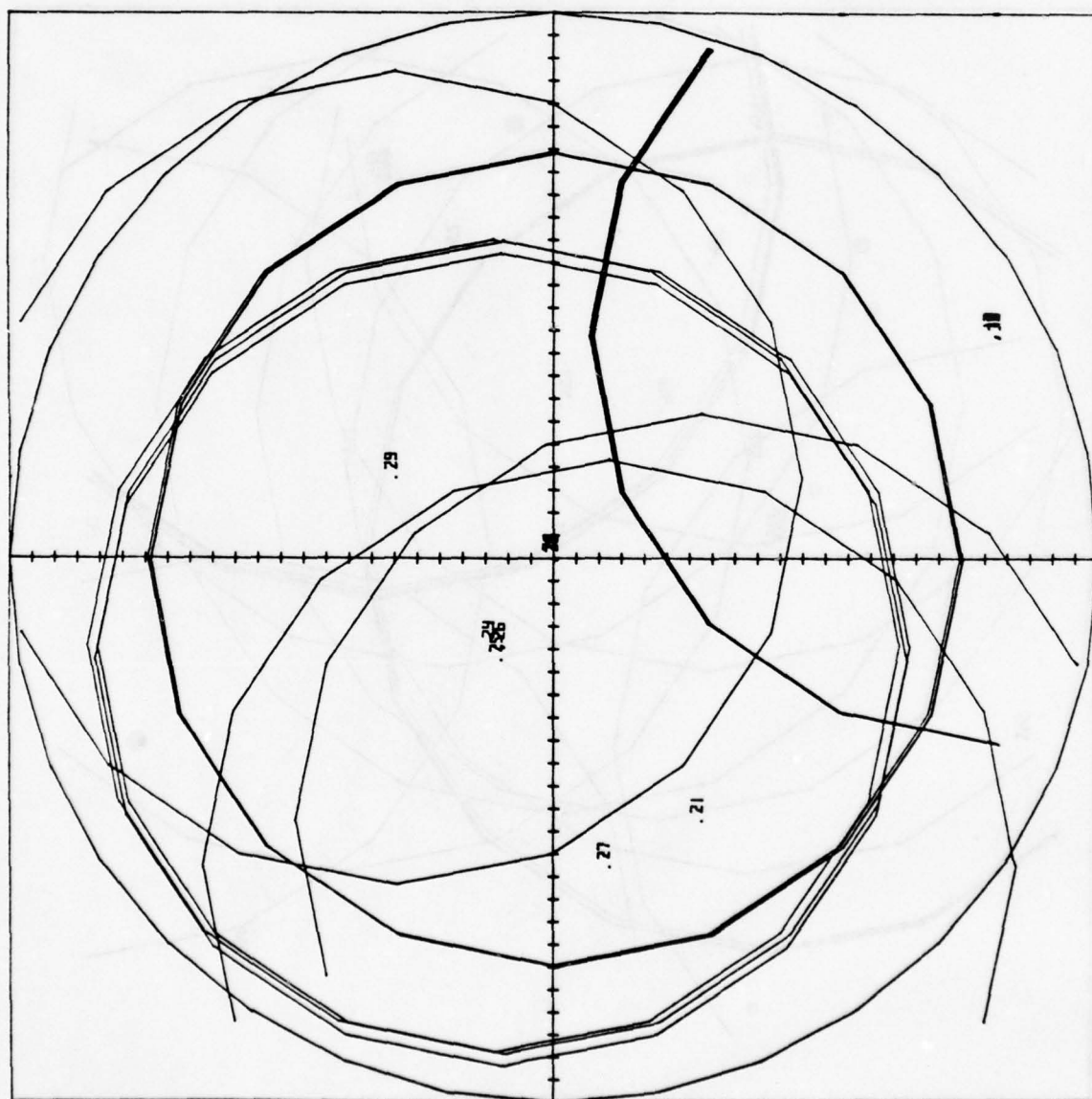




LINE #	552	DEAD NO	ORIGINAL SITE
10000	# 147	0	51,508,0051
10000	# 280	0	50,526,1191
10000	# 446	0	45,450,1191
10000	# 447	0	44,526,2988
10000	# 448	0	44,866,4399
10000	# 449	0	45,068,6172
10000	# 450	0	45,450,3817
10000	# 451	0	44,734,1367
10000	# 452	0	34,552,6276
10000	# 453	0	34,552,60198
10000	# 454	0	50,713,8212
10000	# 455	0	35,738,3062
10000	# 456	0	14,691,7396
10000	# 457	0	55,213,26819
10000	# 552	0	0
10000	# 553	0	51,361,7659
10000	# 558	0	50,879,4826
10000	# 561	0	24,529,0132
10000	# 562	0	23,811,96143
10000	# 563	0	41,503,1760



**PHOENIX, ARIZONA**



D-132

[illegible]



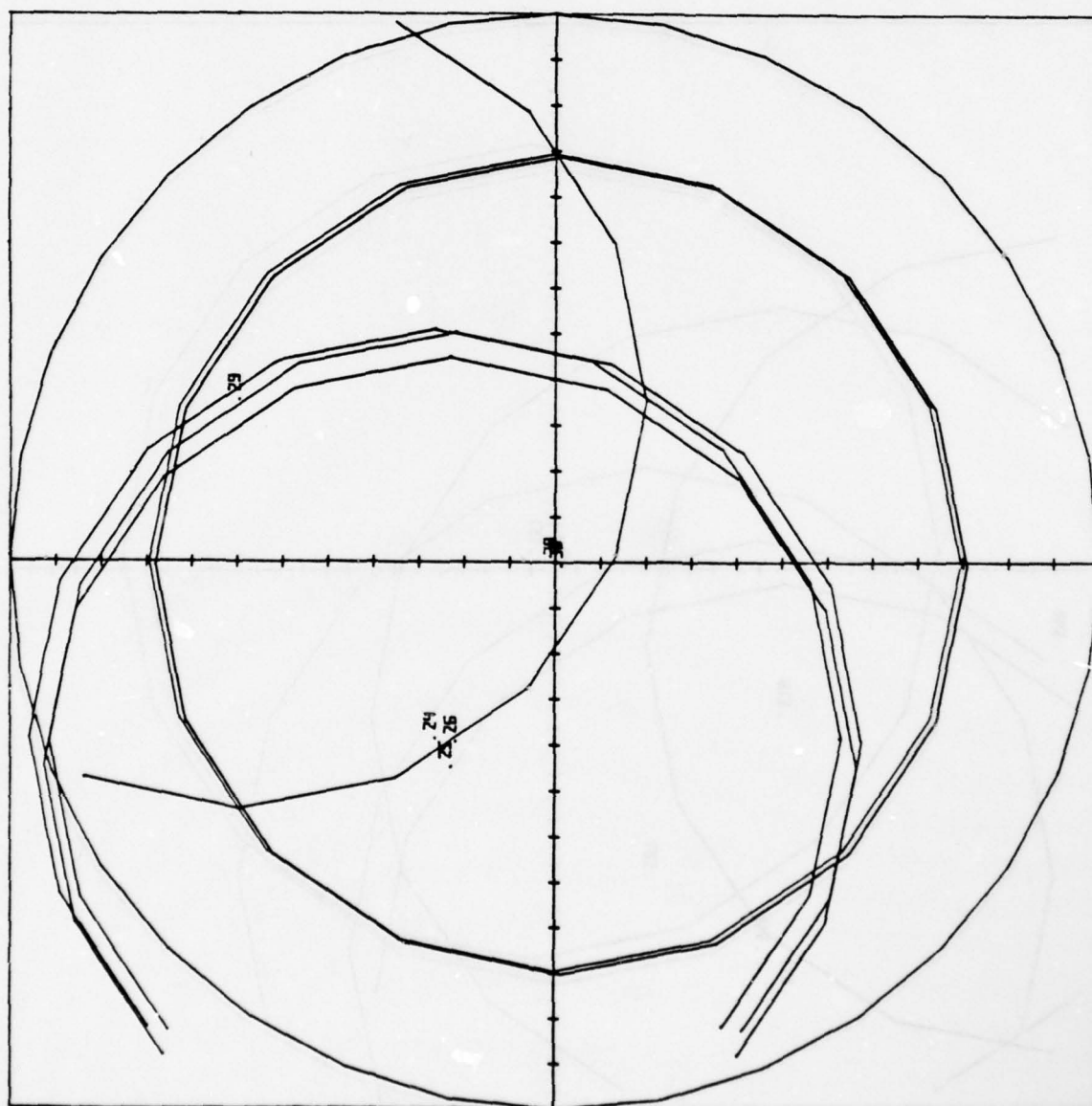
P H X

PHOENIX, ARIZONA

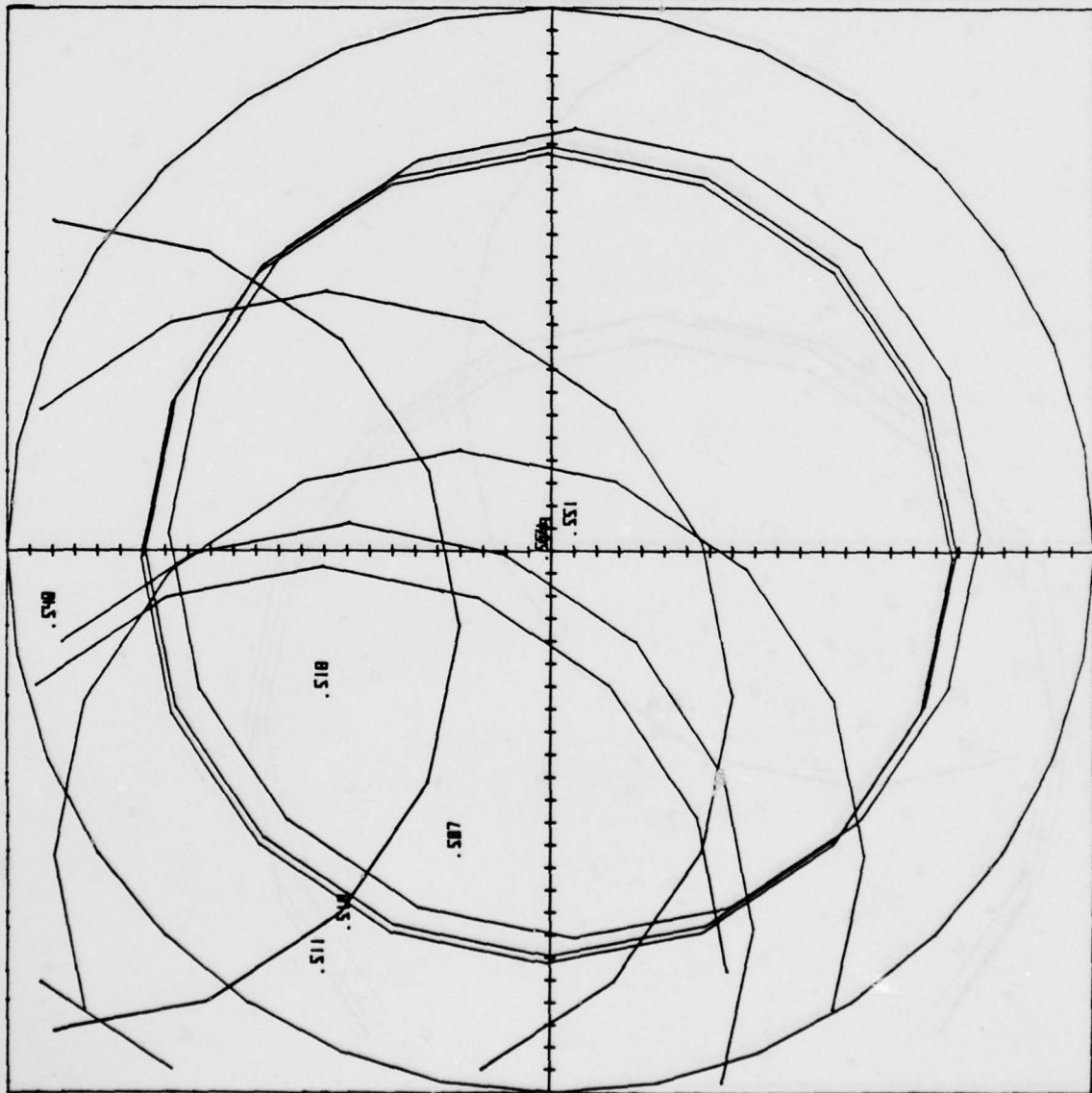
1. Local Time 01/15/80 00:00:00 44.72135  
2. DE OF AREA PHOENIX 000000 60

3. LL # 20 USED NO INITIAL SITE

TIME # 24	01/15/80 00:00:00
TIME # 25	01/15/80 00:00:00
TIME # 26	01/15/80 00:00:00
TIME # 27	01/15/80 00:00:00
TIME # 28	01/15/80 00:00:00
TIME # 29	01/15/80 00:00:00
TIME # 30	01/15/80 00:00:00
TIME # 31	01/15/80 00:00:00







PIT

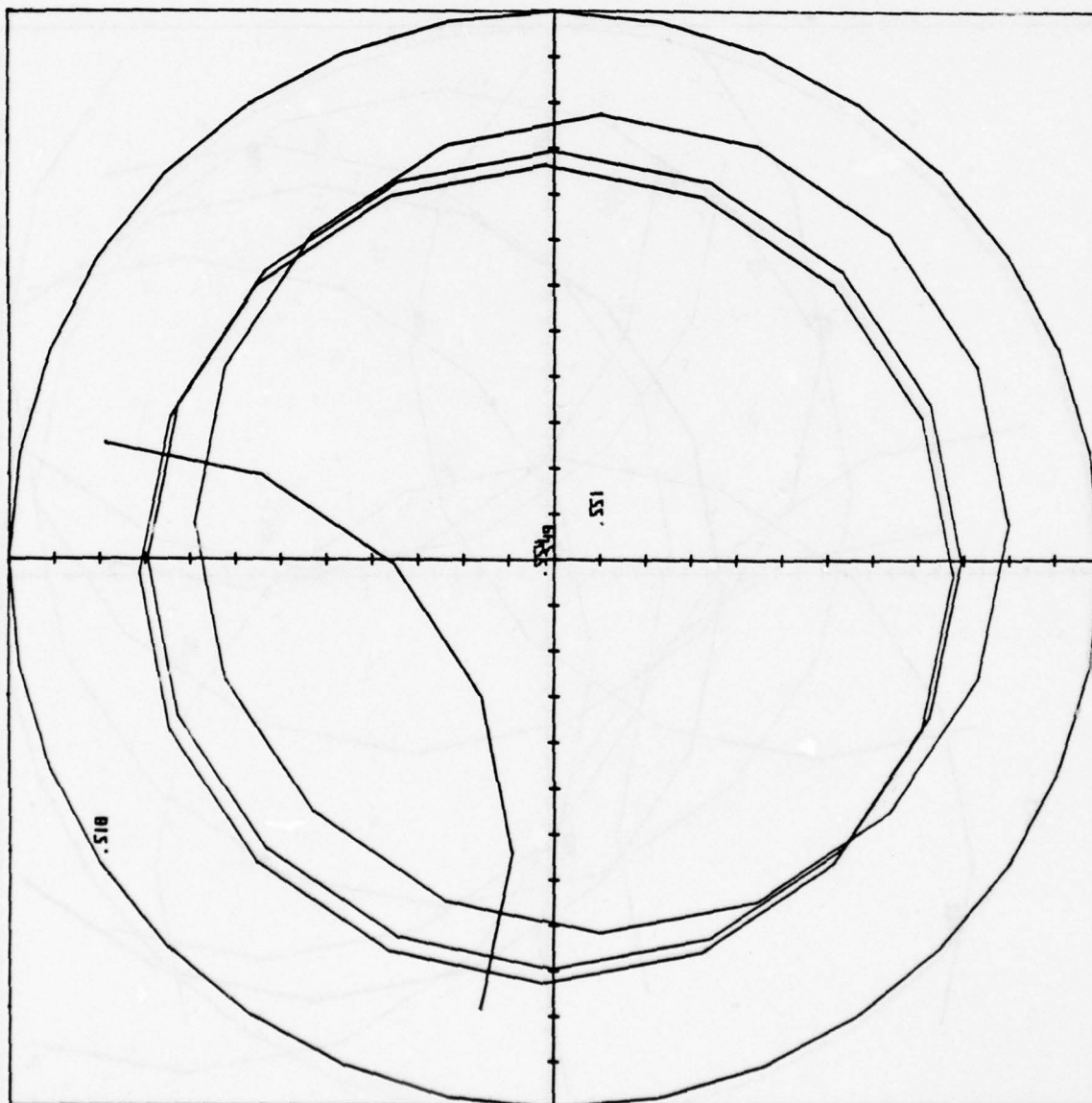
PITTSBURGH, PENN.

DATE 4000 GIVES EARTH 89.4427191  
 CE OF AREA EARTH 100.120

FILE # 549 USED AS NOMINAL SITE

GROUP # 547	W111111	20.05229621	W
GROUP # 510	W111111	94.44622689	W
GROUP # 511	W111111	105.6175424	W
GROUP # 513	W111111	58.19319106	W
GROUP # 547	W111111	110.7900007	W
GROUP # 548	W111111	110.7900007	W
GROUP # 551	W111111	0	W
GROUP # 551	W111111	6.546772714	W
GROUP # 554	W111111	1.8072424	W
.. *****	*****	*****	*****





PIT

PITTSBURGH, PENN.

Light 1000 GIVES PHOTOS 44.72135  
2E OF AREA PHOTOS 44.72135

E # 549 USED NO HODDING SITE

PHOTO # 510 WITHIN 58.79319106

PHOTO # 549 WITHIN 0.00

PHOTO # 551 WITHIN 6.54671244

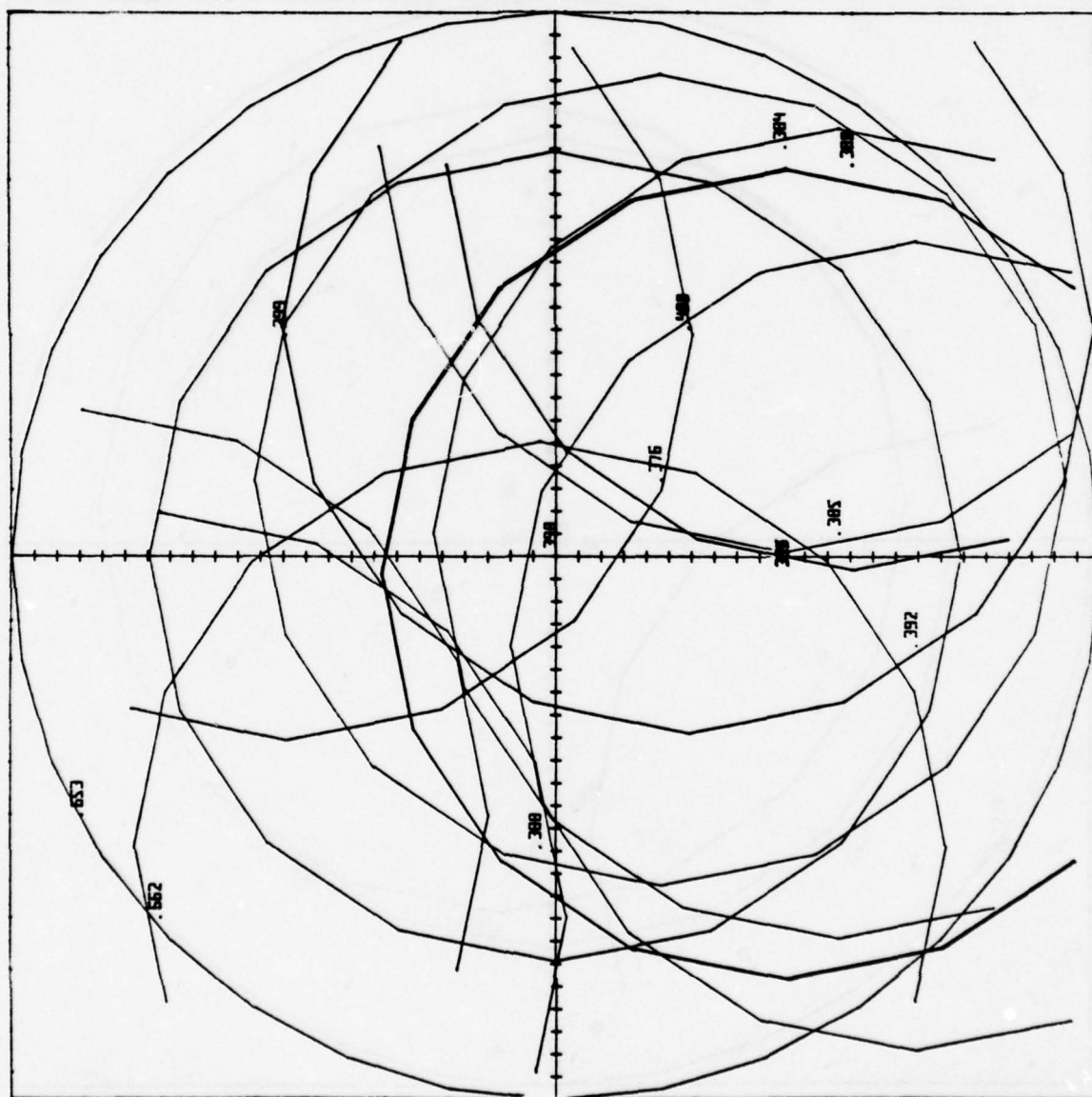
PHOTO # 554 WITHIN 1.807292924

\*\*\* \*\*\*\*\* \*\*\*\*\*



RDU

RALEIGH, N. C.  
DURHAM, N. C.



D-136

1000 4000 6000 8000 10000 12000 14000 16000 18000 20000 22000 24000 26000 28000 30000 32000 34000 36000 38000 40000 42000 44000 46000 48000 50000 52000 54000 56000 58000 60000 62000 64000 66000 68000 70000 72000 74000 76000 78000 80000 82000 84000 86000 88000 90000 92000 94000 96000 98000 100000

LINE #	COORDINATE	LINE #	COORDINATE
1	100000	101	100000
2	100000	102	100000
3	100000	103	100000
4	100000	104	100000
5	100000	105	100000
6	100000	106	100000
7	100000	107	100000
8	100000	108	100000
9	100000	109	100000
10	100000	110	100000
11	100000	111	100000
12	100000	112	100000
13	100000	113	100000
14	100000	114	100000
15	100000	115	100000
16	100000	116	100000
17	100000	117	100000
18	100000	118	100000
19	100000	119	100000
20	100000	120	100000
21	100000	121	100000
22	100000	122	100000
23	100000	123	100000
24	100000	124	100000
25	100000	125	100000
26	100000	126	100000
27	100000	127	100000
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29	100000	129	100000
30	100000	130	100000
31	100000	131	100000
32	100000	132	100000
33	100000	133	100000
34	100000	134	100000
35	100000	135	100000
36	100000	136	100000
37	100000	137	100000
38	100000	138	100000
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41	100000	141	100000
42	100000	142	100000
43	100000	143	100000
44	100000	144	100000
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47	100000	147	100000
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49	100000	149	100000
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51	100000	151	100000
52	100000	152	100000
53	100000	153	100000
54	100000	154	100000
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56	100000	156	100000
57	100000	157	100000
58	100000	158	100000
59	100000	159	100000
60	100000	160	100000
61	100000	161	100000
62	100000	162	100000
63	100000	163	100000
64	100000	164	100000
65	100000	165	100000
66	100000	166	100000
67	100000	167	100000
68	100000	168	100000
69	100000	169	100000
70	100000	170	100000
71	100000	171	100000
72	100000	172	100000
73	100000	173	100000
74	100000	174	100000
75	100000	175	100000
76	100000	176	100000
77	100000	177	100000
78	100000	178	100000
79	100000	179	100000
80	100000	180	100000
81	100000	181	100000
82	100000	182	100000
83	100000	183	100000
84	100000	184	100000
85	100000	185	100000
86	100000	186	100000
87	100000	187	100000
88	100000	188	100000
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92	100000	192	100000
93	100000	193	100000
94	100000	194	100000
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96	100000	196	100000
97	100000	197	100000
98	100000	198	100000
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100	100000	200	100000



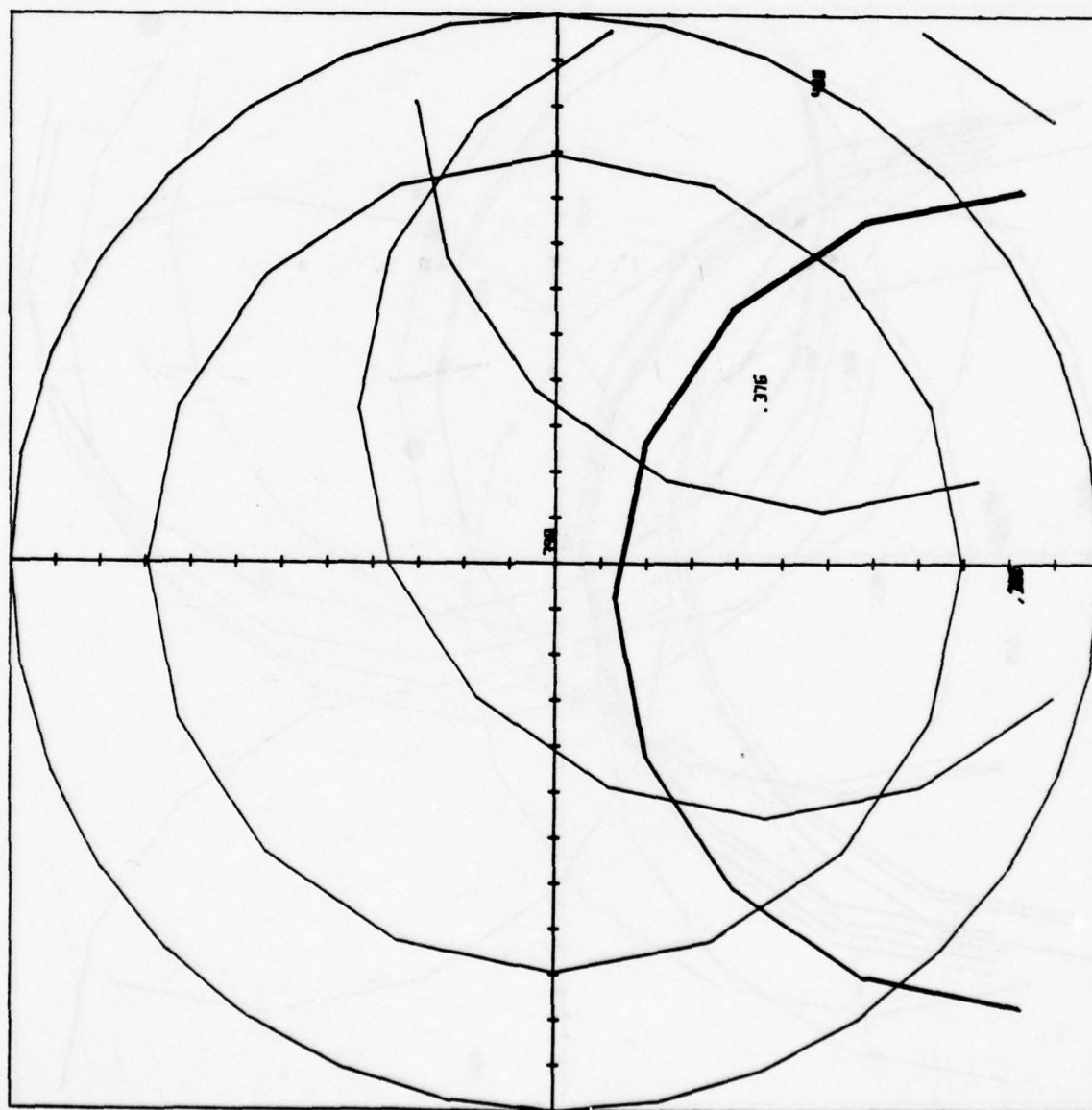
RDU

RALEIGH, N. C.  
DURHAM, N. C.

Full Time GIVES FIDUCIAL 44.7212  
2E OF HELM PROPOS - 100 - 60

LE # 396 USED AS BOUNDING SITE

Point # 376 WITHIN 28.641531  
Point # 396 WITHIN 51.5126425  
Point # 396 WITHIN 51.5087425  
Point # 397 WITHIN 51.5126425  
Point # 398 WITHIN 0 IN  
Point # 400 WITHIN 58.38919027  
Point # 401 WITHIN 58.36534066  
... \*\*\*\*\*



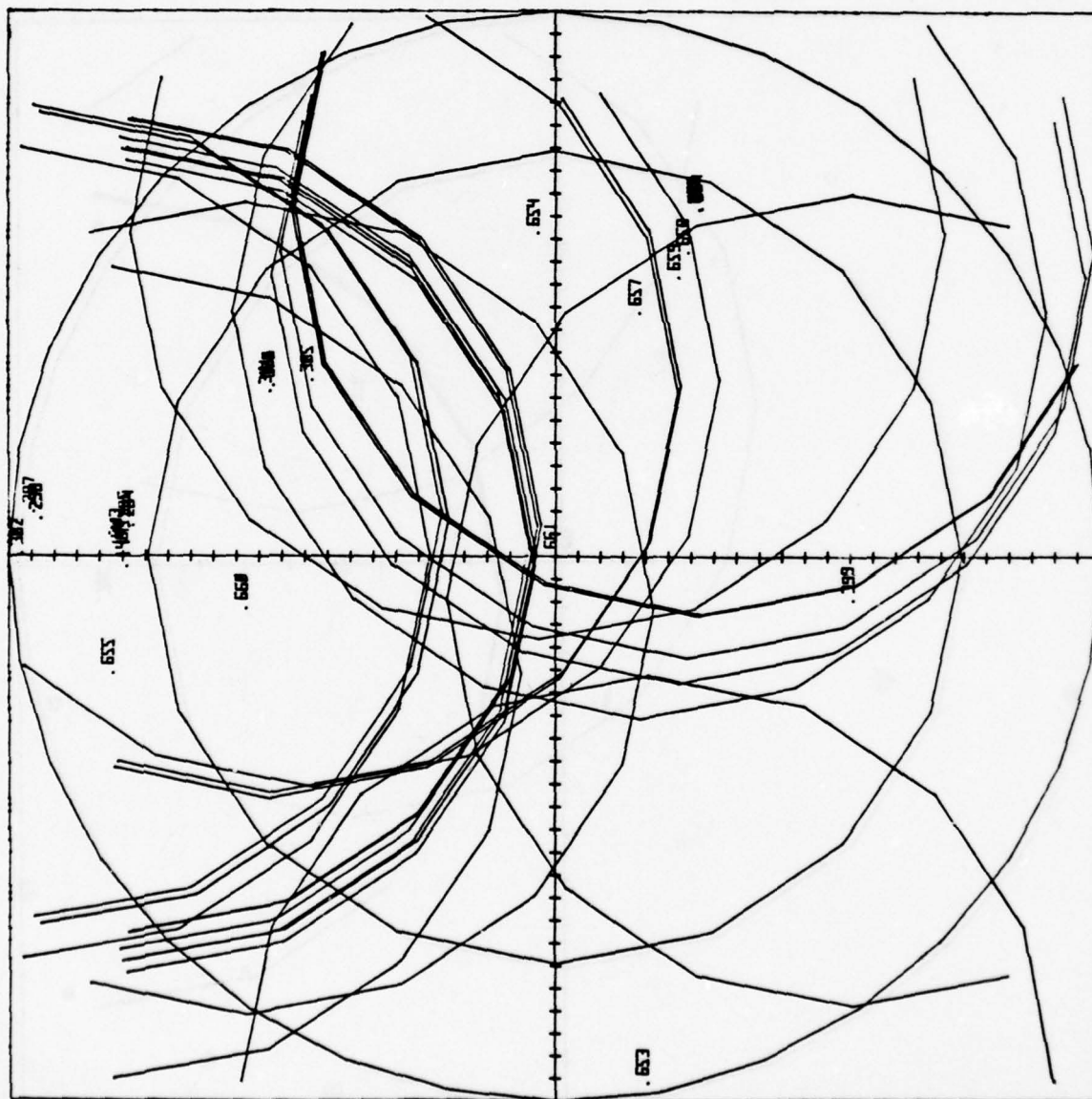


**RICHMOND, VA**

Cell	4000	CLIES	PHBUS	89.44271
CL of 4000	PHBUS	0002	120	

DATE RECEIVED: 10/24/2001

00000	0	144	010000	94,34,30d,267	000
00008	8	145	010000	93,31,29,269	000
00016	16	146	010000	94,00,00,01,34	000
00024	24	147	010000	93,29,26,266	000
00032	32	295	010000	93,29,26,11,11	000
00040	40	297	010000	113,83,73,34	000
00048	48	298	010000	113,24,51,145	000
00056	56	300	010000	72,2,26,48,54	000
00064	64	301	010000	72,2,26,100,7	000
00072	72	302	010000	17,0,1,2,86	000
00080	80	303	010000	95,411,7,439	000
00088	88	305	010000	66,00,0,0,175	000
00096	96	394	010000	6,24,788,21	000
00104	104	653	010000	117,40,30,92	000
00112	112	654	010000	113,10,36,57	000
00120	120	655	010000	100,2,24,7,26	000
00128	128	656	010000	62,0,0,1,366	000
00136	136	657	010000	57,01,5,2,384	000
00144	144	658	010000	72,2,20,0,5,42	000
00152	152	659	010000	63,3,30,2,0,42	000
00160	160	660	010000	68,76,7,1,8,46	000
00168	168	661	010000	W, 00	000
00176	176	662	010000	6,6,4,0,1,266	000
00184	184	664	010000	33,21,33,0,1	000





RIC

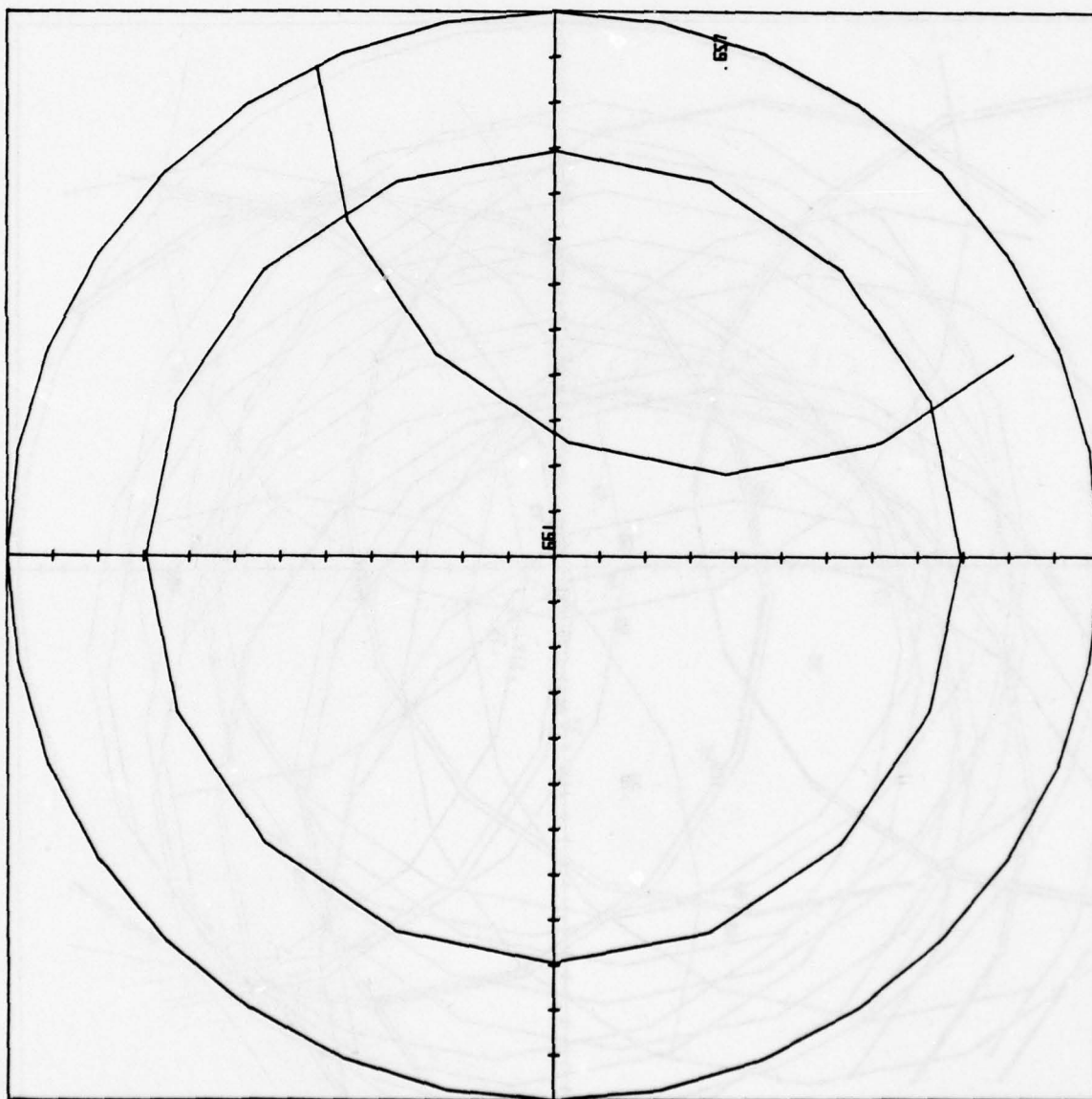
RICHMOND, VA

1000 1000 01000 44.72135  
X OF 0000 00000 000 00

E # 651 USED IN HORIZONTAL SITE

0000 # 651 01000 50.01536284 1

0000 # 651 01000 0 000  
.. ....





THE LEFT 4000 GIVES RADIOS 89.44271910  
SIZE OF LEFT RADIOS (MM) = 120  
THE RIGHT 4000 DIVIDED BY NOMINAL SIZE

Female	# 45	0.0000	53.7, 3854.772	000
Female	# 50	0.0000	118.6, 46.4633	000
Female	# 51	0.0000	118.9, 10381	000
Female	# 52	0.0000	118.9, 910381	000
Female	# 54	0.0000	41.9, 43442	000
Female	# 55	0.0000	46.0, 75901.7	000
Female	# 56	0.0000	43.9, 8652593	000
Female	# 57	0.0000	69.0, 2137903	000
Female	# 58	0.0000	24.7, 3300510	000
Female	# 59	0.0000	14.6, 6872901.3	000
Female	# 60	0.0000	12.6, 837451.3	000
Female	# 62	0.0000	44.8, 8087671	000
Female	# 63	0.0000	43.3, 947119	000
Female	# 64	0.0000	43.3, 5647176	000
Female	# 70	0.0000	97.5, 3447959	000
Female	# 73	0.0000	38.7, 7467831.0	000
Female	# 74	0.0000	38.7, 7467831.0	000
Female	# 75	0.0000	34.7, 654794.2	000
Female	# 76	0.0000	32.6, 53156.5	000
Female	# 77	0.0000	52.3, 4523770	000
Female	# 79	0.0000	11.7, 28444.5	000
Female	# 85	0.0000	75.4, 497864.5	000
Female	# 88	0.0000	94.9, 138.5	000
Female	# 90	0.0000	83.4, 99127.5	000
Female	# 91	0.0000	88.6, 4949005	000
Female	# 92	0.0000	145, 6380476.5	000
Female	# 95	0.0000	11.4, 270303	000
Female	# 96	0.0000	59.2, 2137588	000
Female	# 98	0.0000	30.4, 461791.2	000
Female	# 100	0.0000	42.4, 50001.7	000
Female	# 101	0.0000	42.4, 50001.7	000
Female	# 105	0.0000	94.1, 11151	000
Female	# 106	0.0000	32.0, 336672	000
Female	# 107	0.0000	32.0, 336672	000
Female	# 109	0.0000	30.7, 461791.2	000
Female	# 110	0.0000	50.7, 763310.5	000
Female	# 111	0.0000	26.9, 96720	000
Female	# 112	0.0000	26.9, 96720	000
Female	# 116	0.0000	78.0, 847975	000
Female	# 117	0.0000	71.0, 38479.5	000
Female	# 123	0.0000	53.9, 25173	000
Female	# 124	0.0000	59.6, 257582	000

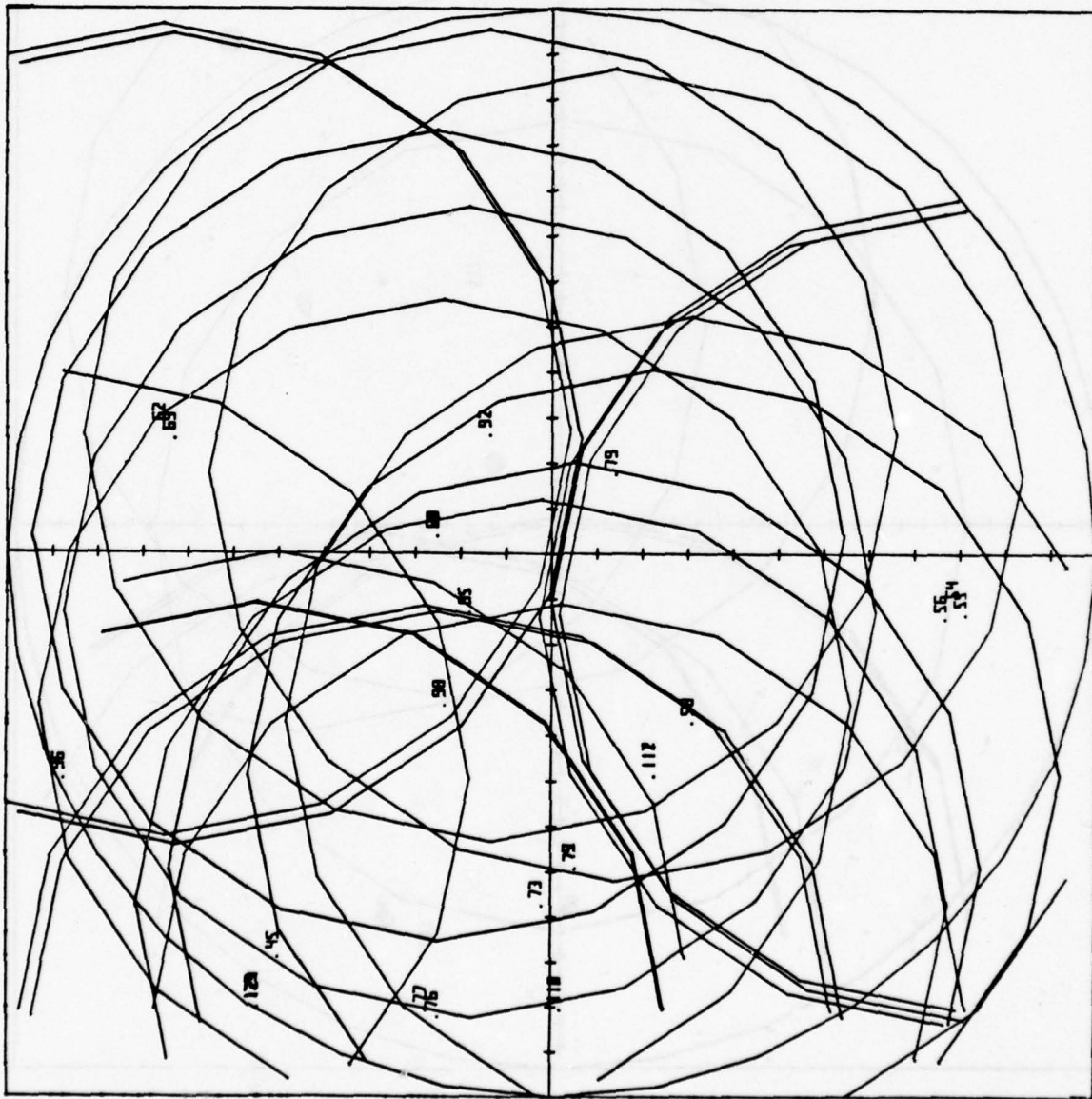


RIV

RIVERSIDE, CAL

1. 1000 GAMES FORTUS 44.721559  
OF NPEH FORTUS 44.721559

NAME	RIV	USED HS	NORTH
LOP # 45	WITHIN	53.72854722	MM
DOP # 54	WITHIN	45.0498442	MM
MEP # 55	WITHIN	46.0594019	MM
FORTUS # 56	WITHIN	43.9855293	MM
FORTUS # 58	WITHIN	44.2300510	MM
FORTUS # 59	WITHIN	42.6827913	MM
FORTUS # 60	WITHIN	42.6827913	MM
FORTUS # 62	WITHIN	44.8087677	MM
FORTUS # 63	WITHIN	43.3694170	MM
FORTUS # 64	WITHIN	43.3694170	MM
FORTUS # 73	WITHIN	38.74678312	MM
FORTUS # 74	WITHIN	34.76549932	MM
FORTUS # 75	WITHIN	34.76549932	MM
FORTUS # 76	WITHIN	52.6573125	MM
FORTUS # 77	WITHIN	52.3452370	MM
FORTUS # 79	WITHIN	11.19284455	MM
FORTUS # 92	WITHIN	14.68804565	MM
FORTUS # 95	WITHIN	11.13470303	MM
FORTUS # 96	WITHIN	59.21731528	MM
FORTUS # 98	WITHIN	20.46193122	MM
FORTUS # 110	WITHIN	50.70873185	MM
FORTUS # 111	WITHIN	26.75996120	MM
FORTUS # 112	WITHIN	26.75996120	MM
FORTUS # 123	WITHIN	59.8351723	MM
FORTUS # 124	WITHIN	59.8351723	MM





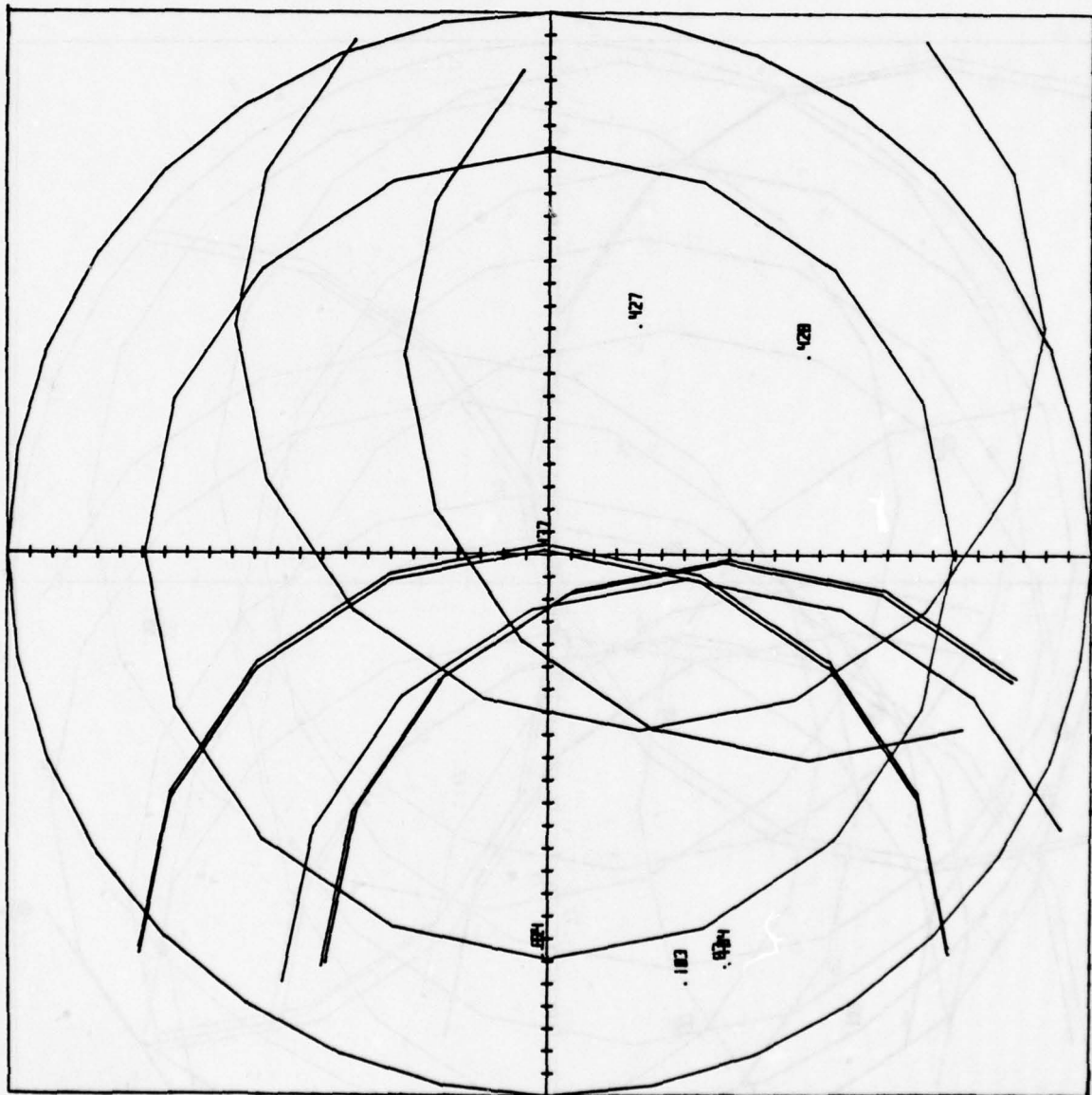
RNO

RENO, NEVADA

LE # 4000 GIVES RADIUS 89.4271  
LE OF AREA (RADIUS \* 3.14) 126

LE # 437 USED AS NOMINAL SITE

PHON # 44 WITHIN 87.10680104  
PHON # 82 WITHIN 88.4466694  
PHON # 83 WITHIN 90.3441767  
PHON # 103 WITHIN 91.7505773  
PHON # 104 WITHIN 93.0550889  
PHON # 427 WITHIN 94.4157702  
PHON # 428 WITHIN 95.8484225  
PHON # 429 WITHIN 97.3643425  
PHON # 437 WITHIN 0 NM \*\*\*\*\*





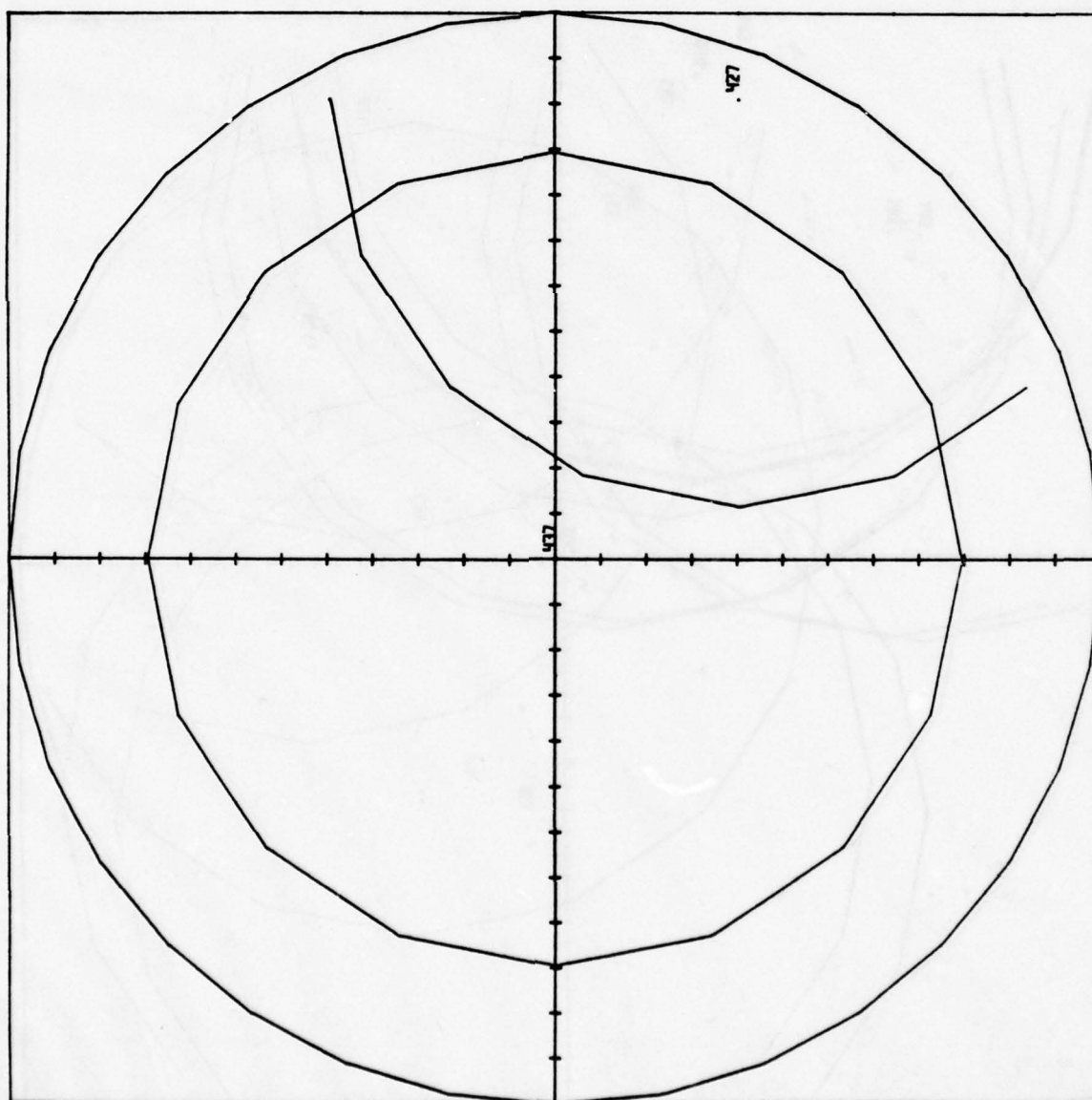
R N O

RENO, NEVADA

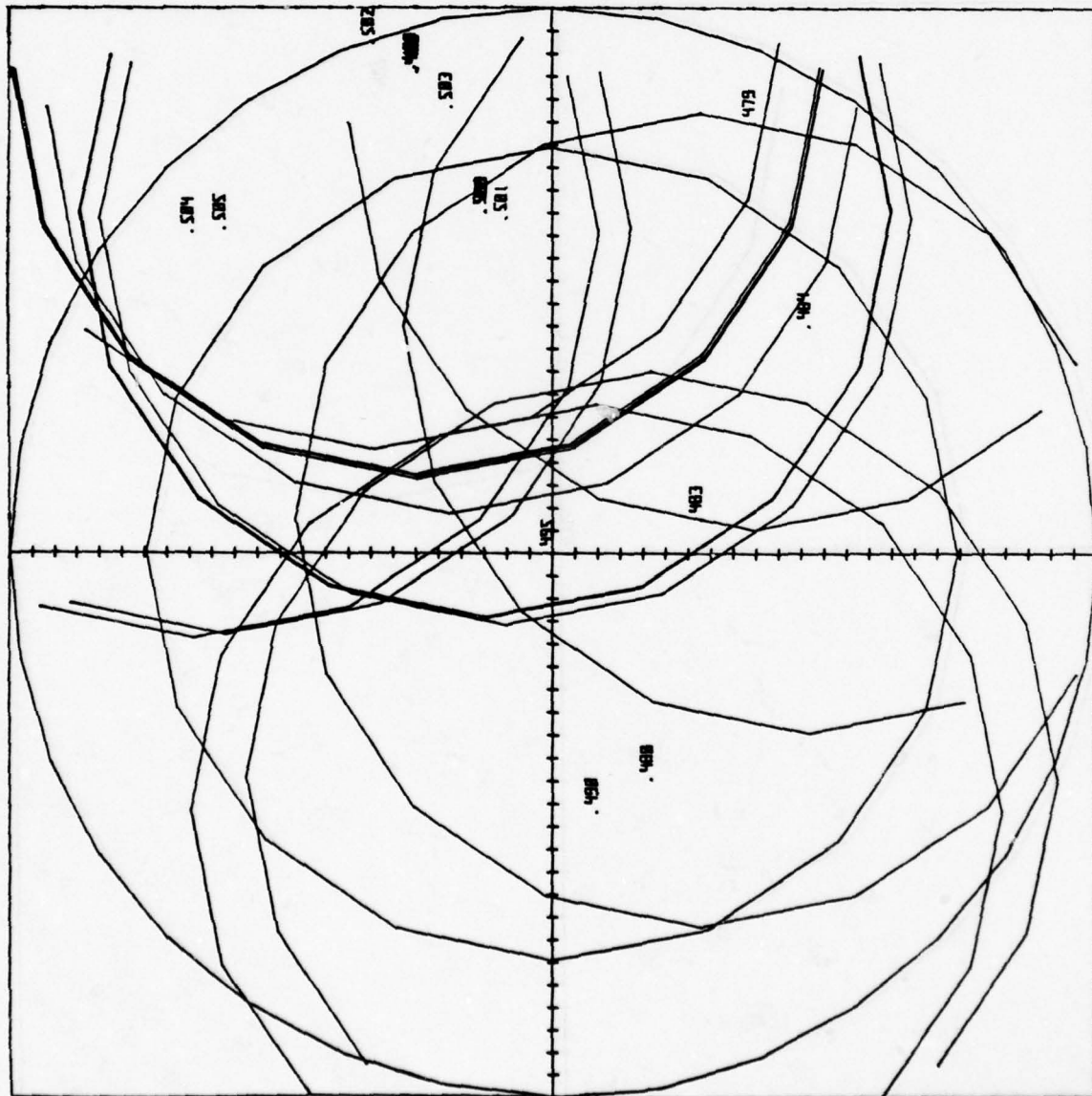
LIGHT 1000 GIVES RADIUS 44.72125  
AGE OF HELIX (RADIUS) 60

FILE # 437 USED AS NORMAL SITE

FRONTS # 427 WITHIN 54.41557902  
FRONTS # 437 WITHIN 0.00  
\*\*\*\* \*\*\*\*\*







D-144

R O C

ROCHESTER, N. Y.

HEIGHT 4000 GIVES RADIIUS 89.44271915  
 2E OF HPEH RADIIUS (MM) 1.0

LE # 495 USED AS HONORAL SITE

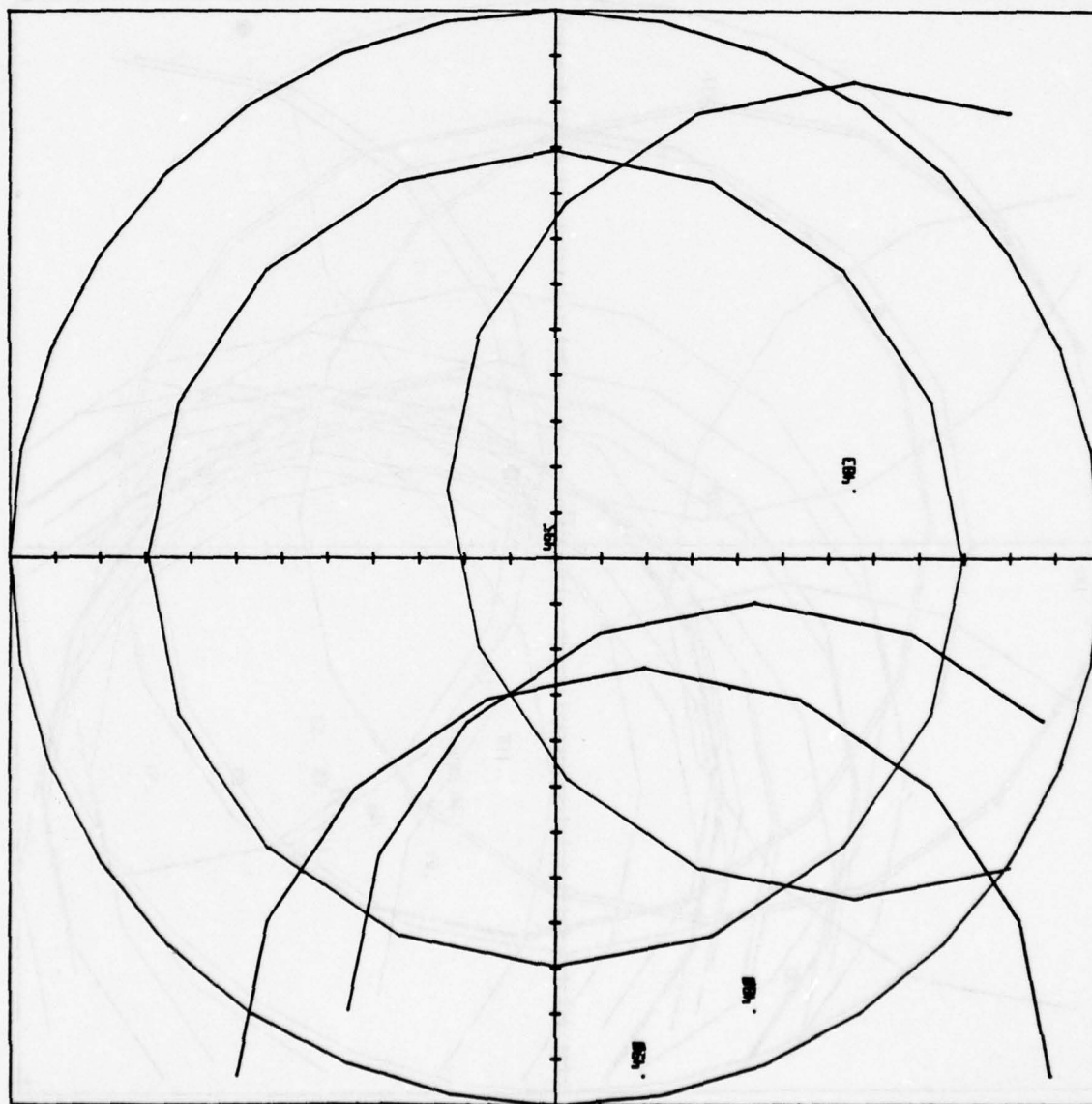
PHOPE # 474	WITHIN 104.6427004	MM
PHOPE # 480	WITHIN 54.1574015	MM
PHOPE # 483	WITHIN 33.6323154	MM
PHOPE # 484	WITHIN 75.6315192	MM
PHOPE # 486	WITHIN 110.5156361	MM
PHOPE # 487	WITHIN 110.5156361	MM
PHOPE # 488	WITHIN 111.0712677	MM
PHOPE # 489	WITHIN 76.79699460	MM
PHOPE # 490	WITHIN 57.54716423	MM
PHOPE # 495	WITHIN 0	MM
PHOPE # 496	WITHIN 109.8791315	MM
PHOPE # 500	WITHIN 76.5175641	MM
PHOPE # 501	WITHIN 74.38450164	MM
PHOPE # 502	WITHIN 113.9053702	MM
PHOPE # 503	WITHIN 100.5948702	MM
PHOPE # 504	WITHIN 100.076034	MM
PHOPE # 505	WITHIN 101.4594231	MM



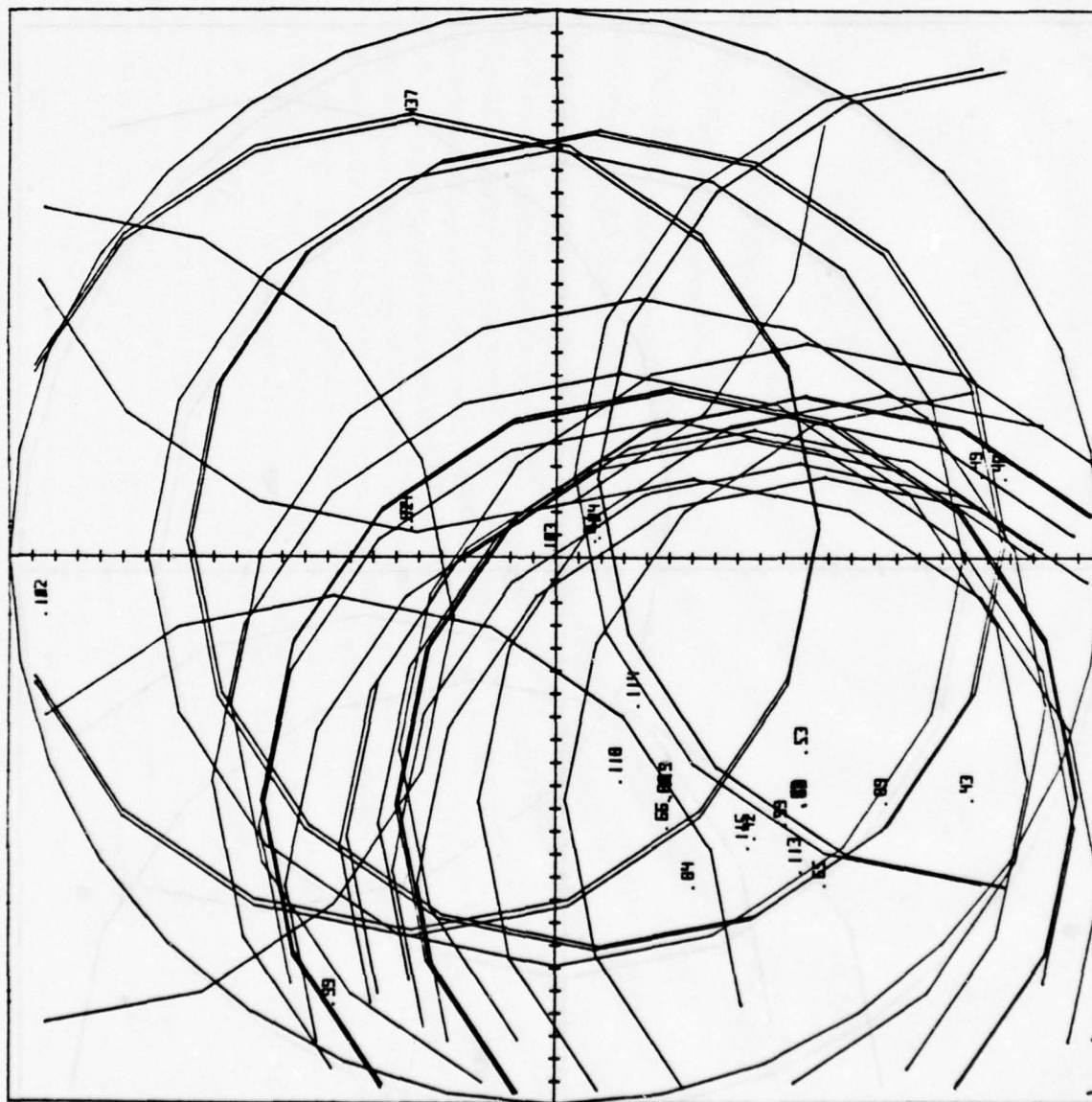
ROC

ROCHESTER, N. Y.

LIGHT 1000 GIVES RADIUS 44.7213  
 DATE OF APEN RADIUS 44.7213  
 FILE # 495 USED AS NOMINAL SITE  
 POINT # 480 WITHIN 54.15740715  
 POINT # 483 WITHIN 33.69228154  
 POINT # 490 WITHIN 57.54716423  
 POINT # 495 WITHIN 0 MI  
 ... \*\*\*\*\*







D-146

S A C  
SACRAMENTO, CAL

GRI 4000 GIVE PRODUCE 87.44271  
E IN HELM PRODUCE 1.29

E # 103 USED AS INITIAL SITE

PRODUCE # 42	W10000	75.29701136	MM
PRODUCE # 43	W10000	105.7502725	MM
PRODUCE # 44	W10000	12.59914397	MM
PRODUCE # 47	W10000	100.0718544	MM
PRODUCE # 48	W10000	100.1237675	MM
PRODUCE # 49	W10000	95.1600093	MM
PRODUCE # 53	W10000	69.5462895	MM
PRODUCE # 55	W10000	92.4009464	MM
PRODUCE # 56	W10000	64.91310650	MM
PRODUCE # 57	W10000	76.67811118	MM
PRODUCE # 58	W10000	77.0134360	MM
PRODUCE # 59	W10000	77.0134360	MM
PRODUCE # 60	W10000	58.75011865	MM
PRODUCE # 81	W10000	50.65011865	MM
PRODUCE # 82	W10000	32.57615165	MM
PRODUCE # 83	W10000	9.22232449	MM
PRODUCE # 84	W10000	78.1146072	MM
PRODUCE # 85	W10000	90.2336588	MM
PRODUCE # 93	W10000	77.27027322	MM
PRODUCE # 94	W10000	77.27027322	MM
PRODUCE # 99	W10000	109.8630049	MM
PRODUCE # 101	W10000	112.7074013	MM
PRODUCE # 103	W10000	0	MM
PRODUCE # 104	W10000	10.4183025	MM
PRODUCE # 113	W10000	87.19917690	MM
PRODUCE # 114	W10000	5.21306629	MM
PRODUCE # 115	W10000	17.18916579	MM
PRODUCE # 116	W10000	50.0842589	MM
PRODUCE # 117	W10000	50.0842589	MM
PRODUCE # 437	W10000	95.7562573	MM

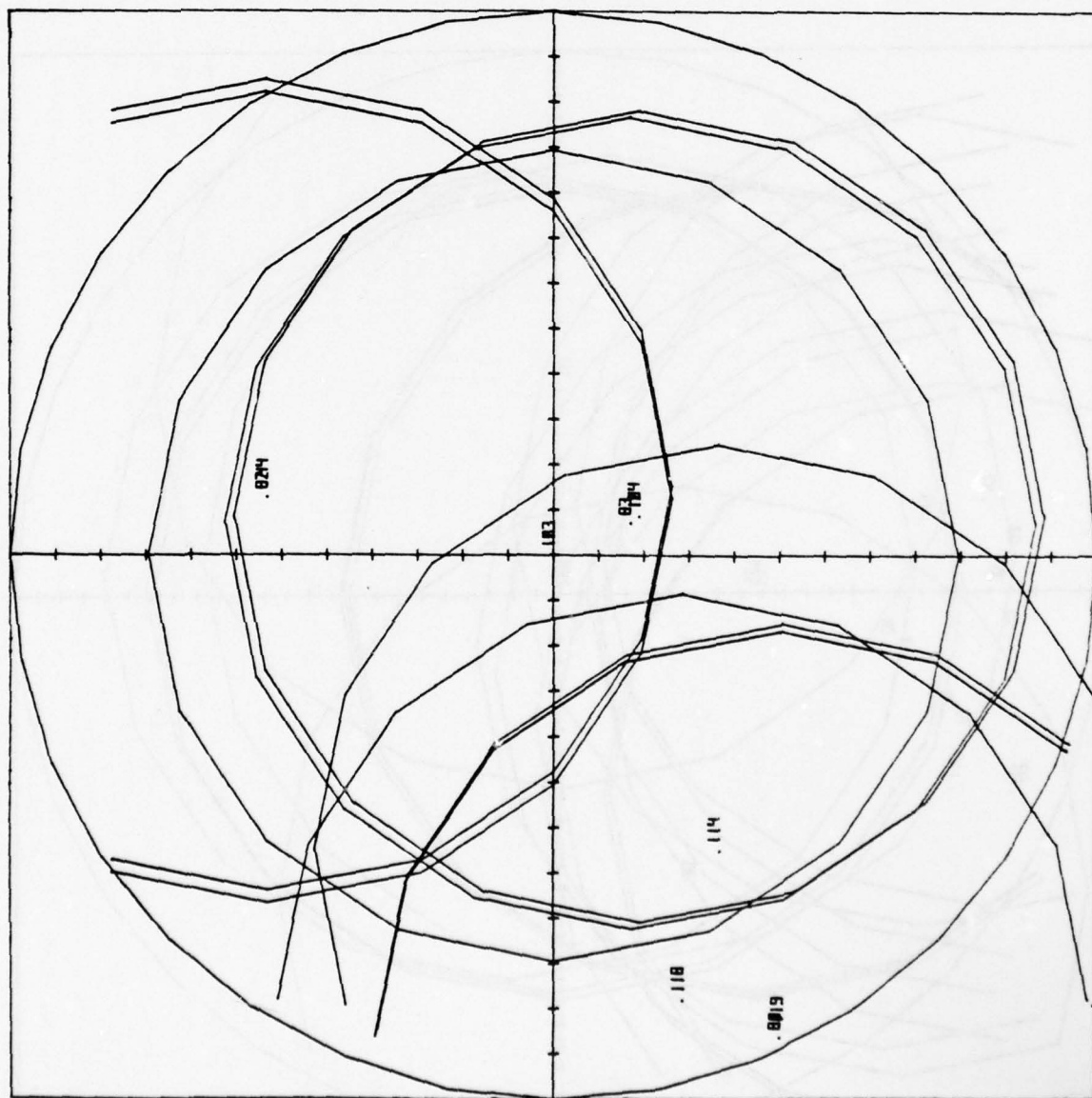


SAC  
SACRAMENTO, CAL

ALL INFO GIVE FIDUCIAL 44.1212  
OF INFO FIDUCIAL 44.1212

1. IN 10' USED IN FIDUCIAL SITE

Point # 44	010000	22.5000	44.1212	00
Point # 45	010000	22.5000	44.1212	00
Point # 46	010000	22.5000	44.1212	00
Point # 47	010000	22.5000	44.1212	00
Point # 48	010000	22.5000	44.1212	00
Point # 49	010000	22.5000	44.1212	00
Point # 50	010000	22.5000	44.1212	00
Point # 51	010000	22.5000	44.1212	00
Point # 52	010000	22.5000	44.1212	00
Point # 53	010000	22.5000	44.1212	00
Point # 54	010000	22.5000	44.1212	00
Point # 55	010000	22.5000	44.1212	00
Point # 56	010000	22.5000	44.1212	00
Point # 57	010000	22.5000	44.1212	00
Point # 58	010000	22.5000	44.1212	00
Point # 59	010000	22.5000	44.1212	00
Point # 60	010000	22.5000	44.1212	00





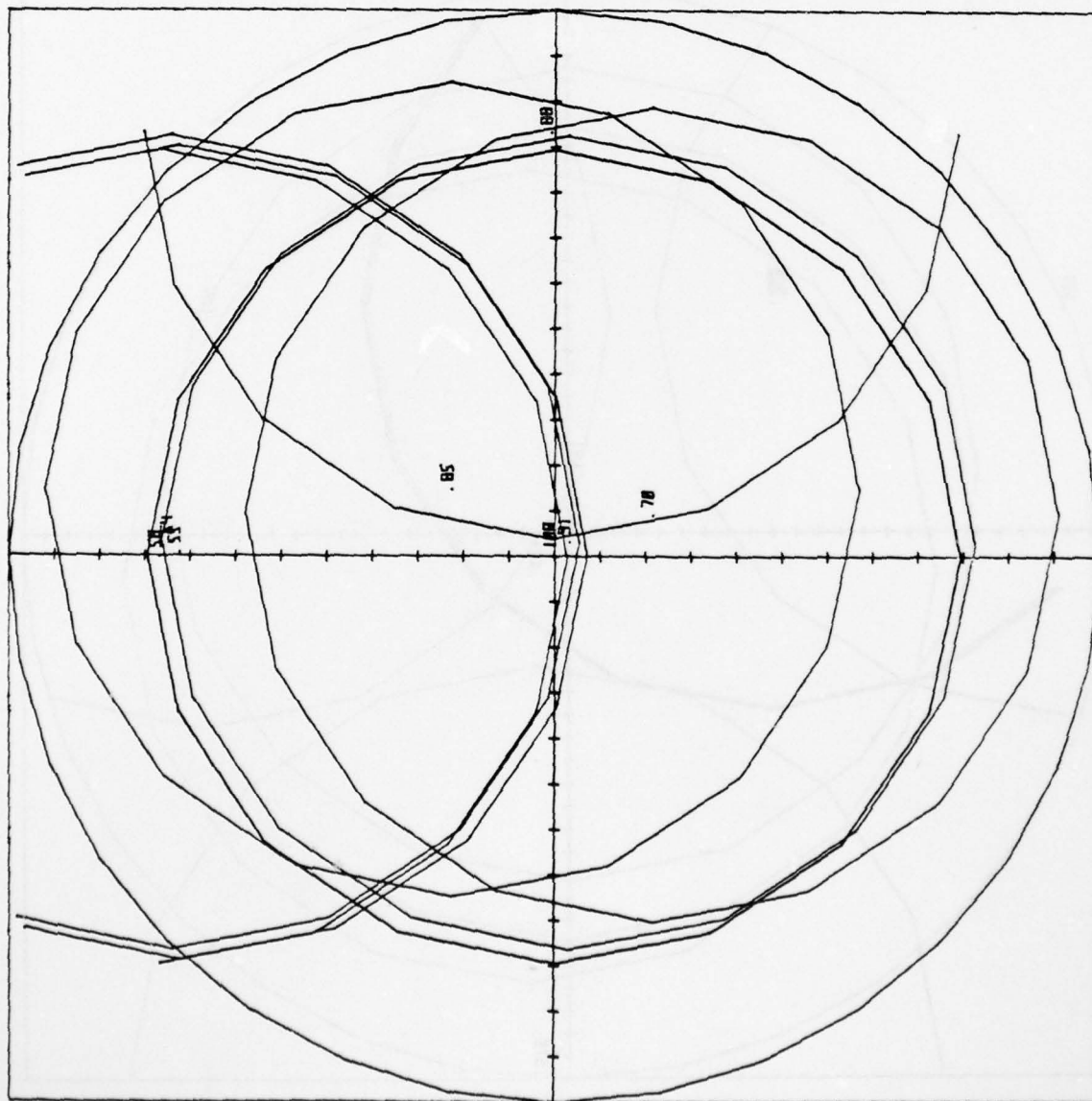
3115 MAY 1964

[illegible]



SAN

SAN DIEGO, CAL



PLAT 1000 GIVE EPOCHS 44.721354  
 11.000000 EPOCHS 100.00

11.000000 GIVE AS INITIAL GIVE

PLAT # 54	11.0000	42.00000000	11
PLAT # 55	11.0000	41.15000000	11
PLAT # 56	11.0000	40.30000000	11
PLAT # 57	11.0000	39.45000000	11
PLAT # 58	11.0000	38.60000000	11
PLAT # 59	11.0000	37.75000000	11
PLAT # 60	11.0000	36.90000000	11
PLAT # 61	11.0000	36.05000000	11
PLAT # 62	11.0000	35.20000000	11
PLAT # 63	11.0000	34.35000000	11
PLAT # 64	11.0000	33.50000000	11
PLAT # 65	11.0000	32.65000000	11
PLAT # 66	11.0000	31.80000000	11
PLAT # 67	11.0000	30.95000000	11
PLAT # 68	11.0000	30.10000000	11
PLAT # 69	11.0000	29.25000000	11
PLAT # 70	11.0000	28.40000000	11
PLAT # 71	11.0000	27.55000000	11
PLAT # 72	11.0000	26.70000000	11
PLAT # 73	11.0000	25.85000000	11
PLAT # 74	11.0000	25.00000000	11
PLAT # 75	11.0000	24.15000000	11
PLAT # 76	11.0000	23.30000000	11
PLAT # 77	11.0000	22.45000000	11
PLAT # 78	11.0000	21.60000000	11
PLAT # 79	11.0000	20.75000000	11
PLAT # 80	11.0000	19.90000000	11
PLAT # 81	11.0000	19.05000000	11
PLAT # 82	11.0000	18.20000000	11
PLAT # 83	11.0000	17.35000000	11
PLAT # 84	11.0000	16.50000000	11
PLAT # 85	11.0000	15.65000000	11
PLAT # 86	11.0000	14.80000000	11
PLAT # 87	11.0000	13.95000000	11
PLAT # 88	11.0000	13.10000000	11
PLAT # 89	11.0000	12.25000000	11
PLAT # 90	11.0000	11.40000000	11
PLAT # 91	11.0000	10.55000000	11
PLAT # 92	11.0000	9.70000000	11
PLAT # 93	11.0000	8.85000000	11
PLAT # 94	11.0000	8.00000000	11
PLAT # 95	11.0000	7.15000000	11
PLAT # 96	11.0000	6.30000000	11
PLAT # 97	11.0000	5.45000000	11
PLAT # 98	11.0000	4.60000000	11
PLAT # 99	11.0000	3.75000000	11
PLAT # 100	11.0000	2.90000000	11
PLAT # 101	11.0000	2.05000000	11
PLAT # 102	11.0000	1.20000000	11
PLAT # 103	11.0000	0.35000000	11
PLAT # 104	11.0000	-0.50000000	11
PLAT # 105	11.0000	-1.35000000	11
PLAT # 106	11.0000	-2.20000000	11
PLAT # 107	11.0000	-3.05000000	11
PLAT # 108	11.0000	-3.90000000	11
PLAT # 109	11.0000	-4.75000000	11
PLAT # 110	11.0000	-5.60000000	11
PLAT # 111	11.0000	-6.45000000	11
PLAT # 112	11.0000	-7.30000000	11
PLAT # 113	11.0000	-8.15000000	11
PLAT # 114	11.0000	-9.00000000	11
PLAT # 115	11.0000	-9.85000000	11
PLAT # 116	11.0000	-10.70000000	11
PLAT # 117	11.0000	-11.55000000	11
PLAT # 118	11.0000	-12.40000000	11
PLAT # 119	11.0000	-13.25000000	11
PLAT # 120	11.0000	-14.10000000	11
PLAT # 121	11.0000	-14.95000000	11
PLAT # 122	11.0000	-15.80000000	11
PLAT # 123	11.0000	-16.65000000	11
PLAT # 124	11.0000	-17.50000000	11
PLAT # 125	11.0000	-18.35000000	11
PLAT # 126	11.0000	-19.20000000	11
PLAT # 127	11.0000	-20.05000000	11
PLAT # 128	11.0000	-20.90000000	11
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PLAT # 130	11.0000	-22.60000000	11
PLAT # 131	11.0000	-23.45000000	11
PLAT # 132	11.0000	-24.30000000	11
PLAT # 133	11.0000	-25.15000000	11
PLAT # 134	11.0000	-26.00000000	11
PLAT # 135	11.0000	-26.85000000	11
PLAT # 136	11.0000	-27.70000000	11
PLAT # 137	11.0000	-28.55000000	11
PLAT # 138	11.0000	-29.40000000	11
PLAT # 139	11.0000	-30.25000000	11
PLAT # 140	11.0000	-31.10000000	11
PLAT # 141	11.0000	-31.95000000	11
PLAT # 142	11.0000	-32.80000000	11
PLAT # 143	11.0000	-33.65000000	11
PLAT # 144	11.0000	-34.50000000	11
PLAT # 145	11.0000	-35.35000000	11
PLAT # 146	11.0000	-36.20000000	11
PLAT # 147	11.0000	-37.05000000	11
PLAT # 148	11.0000	-37.90000000	11
PLAT # 149	11.0000	-38.75000000	11
PLAT # 150	11.0000	-39.60000000	11
PLAT # 151	11.0000	-40.45000000	11
PLAT # 152	11.0000	-41.30000000	11
PLAT # 153	11.0000	-42.15000000	11
PLAT # 154	11.0000	-43.00000000	11
PLAT # 155	11.0000	-43.85000000	11
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PLAT # 157	11.0000	-45.55000000	11
PLAT # 158	11.0000	-46.40000000	11
PLAT # 159	11.0000	-47.25000000	11
PLAT # 160	11.0000	-48.10000000	11
PLAT # 161	11.0000	-48.95000000	11
PLAT # 162	11.0000	-49.80000000	11
PLAT # 163	11.0000	-50.65000000	11
PLAT # 164	11.0000	-51.50000000	11
PLAT # 165	11.0000	-52.35000000	11
PLAT # 166	11.0000	-53.20000000	11
PLAT # 167	11.0000	-54.05000000	11
PLAT # 168	11.0000	-54.90000000	11
PLAT # 169	11.0000	-55.75000000	11
PLAT # 170	11.0000	-56.60000000	11
PLAT # 171	11.0000	-57.45000000	11
PLAT # 172	11.0000	-58.30000000	11
PLAT # 173	11.0000	-59.15000000	11
PLAT # 174	11.0000	-60.00000000	11
PLAT # 175	11.0000	-60.85000000	11
PLAT # 176	11.0000	-61.70000000	11
PLAT # 177	11.0000	-62.55000000	11
PLAT # 178	11.0000	-63.40000000	11
PLAT # 179	11.0000	-64.25000000	11
PLAT # 180	11.0000	-65.10000000	11
PLAT # 181	11.0000	-65.95000000	11
PLAT # 182	11.0000	-66.80000000	11
PLAT # 183	11.0000	-67.65000000	11
PLAT # 184	11.0000	-68.50000000	11
PLAT # 185	11.0000	-69.35000000	11
PLAT # 186	11.0000	-70.20000000	11
PLAT # 187	11.0000	-71.05000000	11
PLAT # 188	11.0000	-71.90000000	11
PLAT # 189	11.0000	-72.75000000	11
PLAT # 190	11.0000	-73.60000000	11
PLAT # 191	11.0000	-74.45000000	11
PLAT # 192	11.0000	-75.30000000	11
PLAT # 193	11.0000	-76.15000000	11
PLAT # 194	11.0000	-77.00000000	11
PLAT # 195	11.0000	-77.85000000	11
PLAT # 196	11.0000	-78.70000000	11
PLAT # 197	11.0000	-79.55000000	11
PLAT # 198	11.0000	-80.40000000	11
PLAT # 199	11.0000	-81.25000000	11
PLAT # 200	11.0000	-82.10000000	11
PLAT # 201	11.0000	-82.95000000	11
PLAT # 202	11.0000	-83.80000000	11
PLAT # 203	11.0000	-84.65000000	11
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PLAT # 205	11.0000	-86.35000000	11
PLAT # 206	11.0000	-87.20000000	11
PLAT # 207	11.0000	-88.05000000	11
PLAT # 208	11.0000	-88.90000000	11
PLAT # 209	11.0000	-89.75000000	11
PLAT # 210	11.0000	-90.60000000	11
PLAT # 211	11.0000	-91.45000000	11
PLAT # 212	11.0000	-92.30000000	11
PLAT # 213	11.0000	-93.15000000	11
PLAT # 214	11.0000	-94.00000000	11
PLAT # 215	11.0000	-94.85000000	11
PLAT # 216	11.0000	-95.70000000	11
PLAT # 217	11.0000	-96.55000000	11
PLAT # 218	11.0000	-97.40000000	11
PLAT # 219	11.0000	-98.25000000	11
PLAT # 220	11.0000	-99.10000000	11
PLAT # 221	11.0000	-99.95000000	11
PLAT # 222	11.0000	-100.80000000	11
PLAT # 223	11.0000	-101.65000000	11
PLAT # 224	11.0000	-102.50000000	11
PLAT # 225	11.0000	-103.35000000	11
PLAT # 226	11.0000	-104.20000000	11
PLAT # 227	11.0000	-105.05000000	11
PLAT # 228	11.0000	-105.90000000	11
PLAT # 229	11.0000	-106.75000000	11
PLAT # 230	11.0000	-107.60000000	11
PLAT # 231	11.0000	-108.45000000	11
PLAT # 232	11.0000	-109.30000000	11
PLAT # 233	11.0000	-110.15000000	11
PLAT # 234	11.0000	-111.00000000	11
PLAT # 235	11.0000	-111.85000000	11
PLAT # 236	11.0000	-112.70000000	11
PLAT # 237	11.0000	-113.55000000	11
PLAT # 238	11.0000	-114.40000000	11
PLAT # 239	11.0000	-115.25000000	11
PLAT # 240	11.0000	-116.10000000	11
PLAT # 241	11.0000	-116.95000000	11
PLAT # 242	11.0000	-117.80000000	11
PLAT # 243	11.0000	-118.65000000	11
PLAT # 244	11.0000	-119.50000000	11
PLAT # 245	11.0000	-120.35000000	11
PLAT # 246	11.0000	-121.20000000	11
PLAT # 247	11.0000	-122.05000000	11
PLAT # 248	11.0000	-122.90000000	11
PLAT # 249	11.0000	-123.75000000	11
PLAT # 250	11.0000	-124.60000000	11
PLAT # 251	11.0000	-125.45000000	11
PLAT # 252	11.0000	-126.30000000	11
PLAT # 253	11.0000	-127.15000000	11
PLAT # 254	11.0000	-128.00000000	11
PLAT # 255	11.0000	-128.85000000	11
PLAT # 256	11.0000	-129.70000000	11
PLAT # 257	11.0000	-130.55000000	11
PLAT # 258	11.0000	-131.40000000	11
PLAT # 259	11.0000	-132.25000000	11
PLAT # 260	11.0000	-133.10000000	11
PLAT # 261	11.0000	-133.9500000	

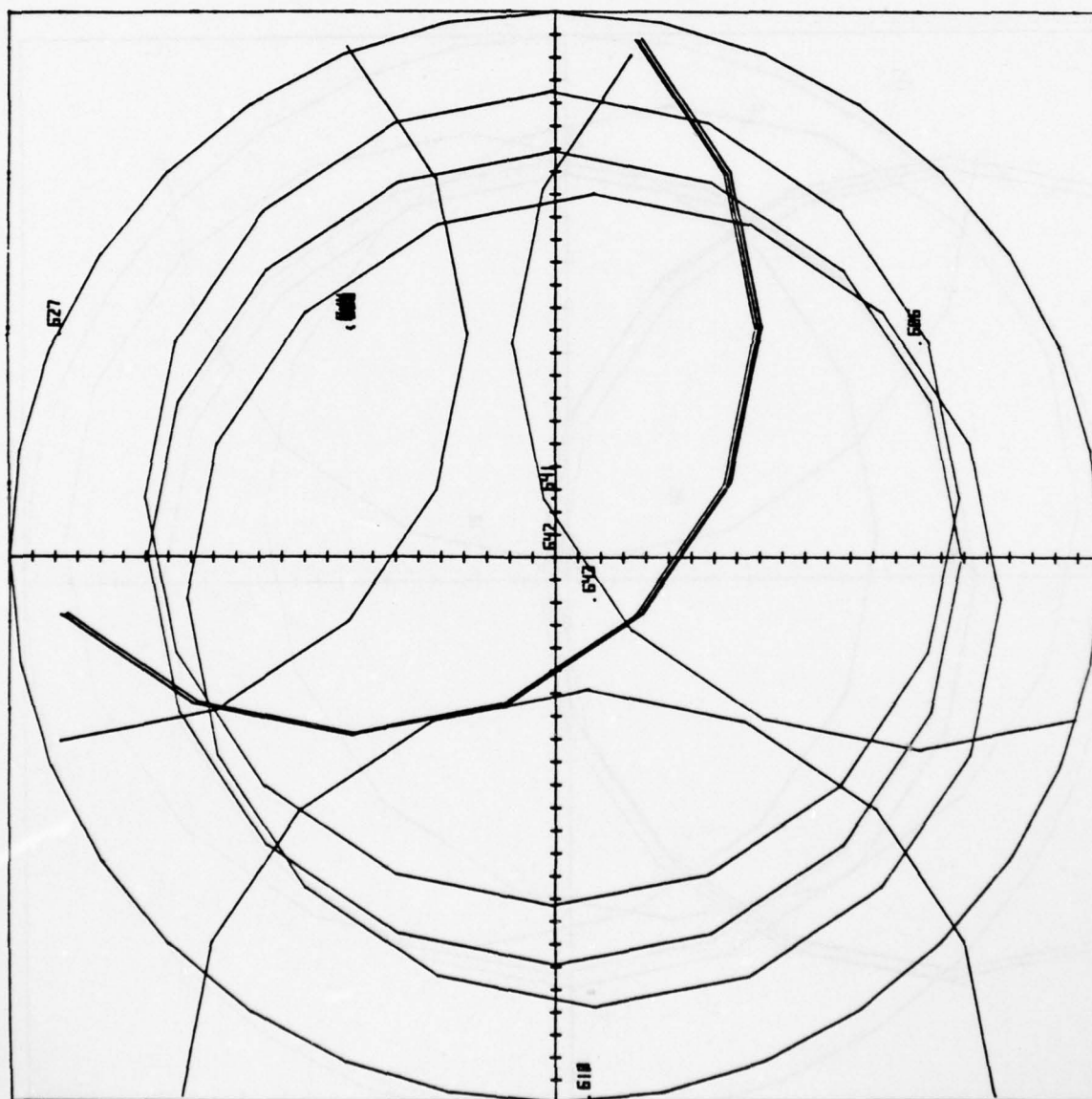


**SAN ANTONIO, TEXAS**

WEIGHT 4000 GIVE PHOTOS 89.44214  
LET OF HEN PHOTOS 104.120

FILE # 642 USED IN MURKIN SITE

Frage	#	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095	096	097	098	099	100
Frage	1	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095	096	097	098	099	100



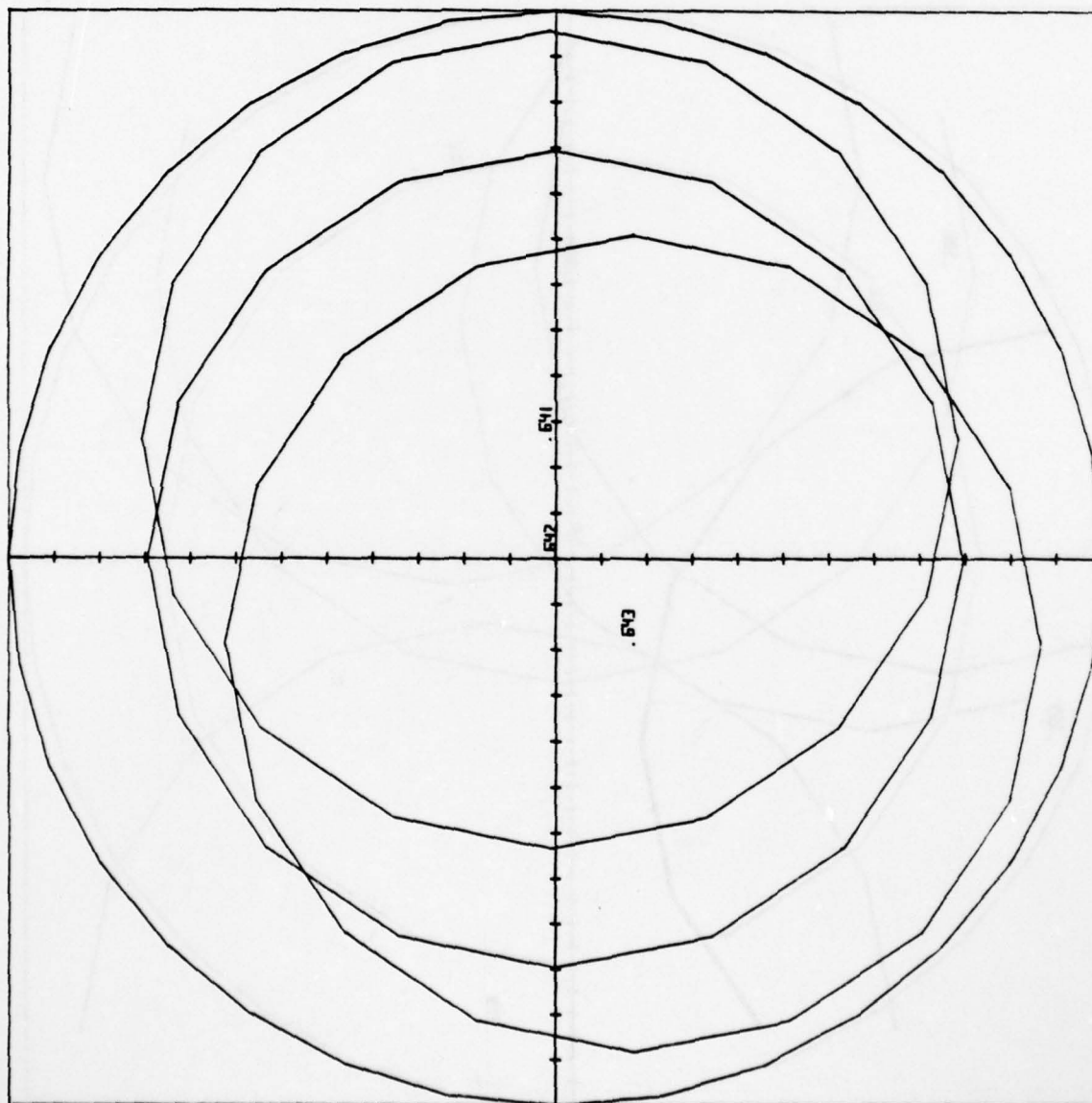
D-150



SAT

SAN ANTONIO, TEXAS

1000 1000 GIVES RADIOS 44.7213  
 PL OF MEER RADIOS 100.0 60  
 LE # 642 USED AS NORMAL SITE  
 PULSE # 641 WITHIN 13.00542488  
 PULSE # 642 WITHIN 0 100  
 PULSE # 643 WITHIN 12.64107335  
 ... \*\*\*\*\*





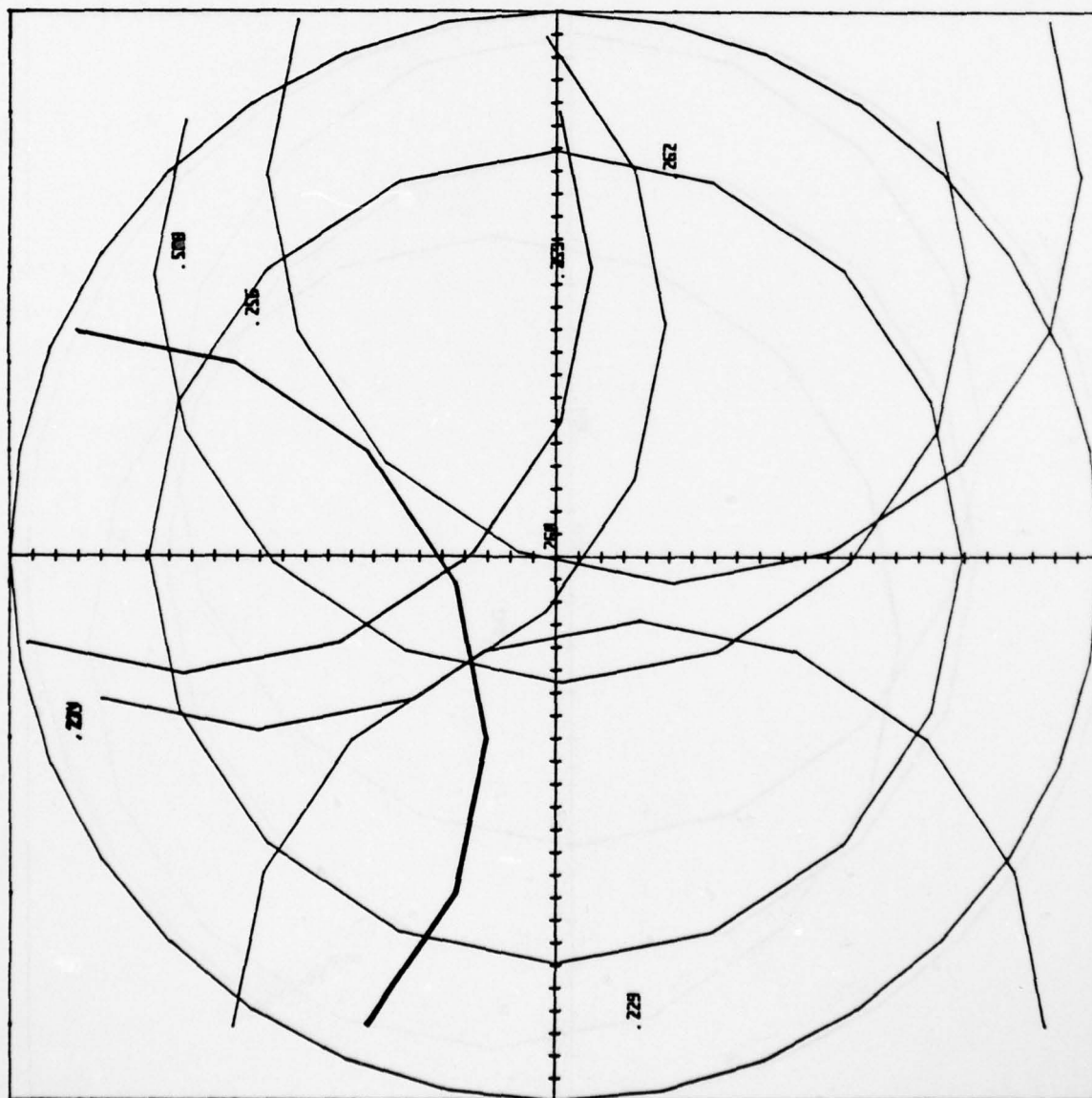
S D F

LOUISVILLE, KY.

BL1000 4000 CIVIL ENGINE 89.41271  
 CLE OF AREA RADIO 1000 120

FILE # 200 USED BY HORIZONTAL SITE

PLANE # 204 BL1000 107.1447514  
 PLANE # 203 BL1000 111.9112610  
 PLANE # 204 BL1000 112.2002500  
 PLANE # 205 BL1000 83.9050000  
 PLANE # 200 BL1000 61.7034700  
 PLANE # 200 BL1000 0 000  
 PLANE # 202 BL1000 81.2740000  
 PLANE # 203 BL1000 103.6000000  
 PLANE # 203 BL1000 101.6000000





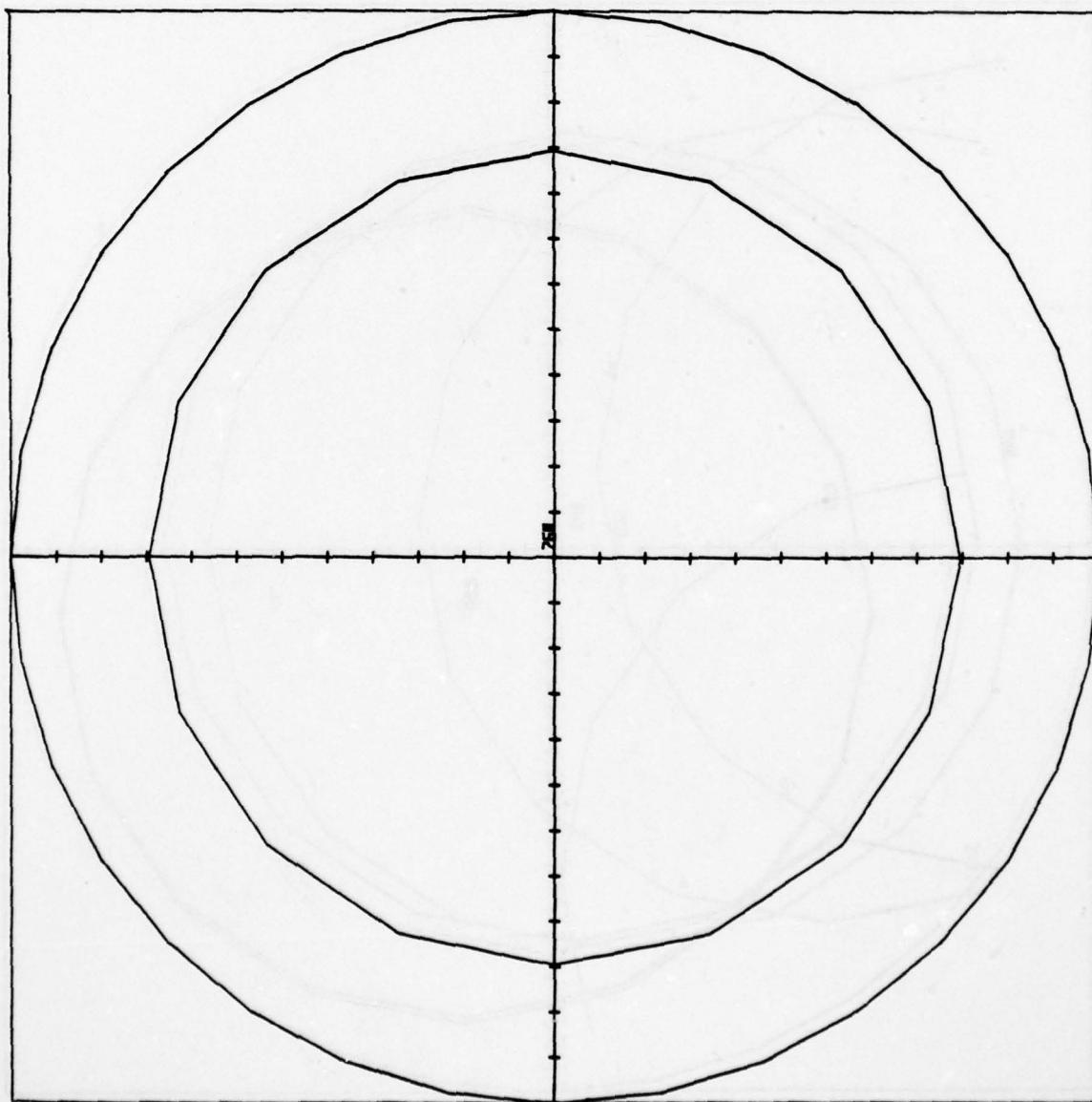
S D F

LOUISVILLE, KY.

1000 1000 GIVES RADIUS 44.7213  
1E OF AREA RADIUS 44.7213

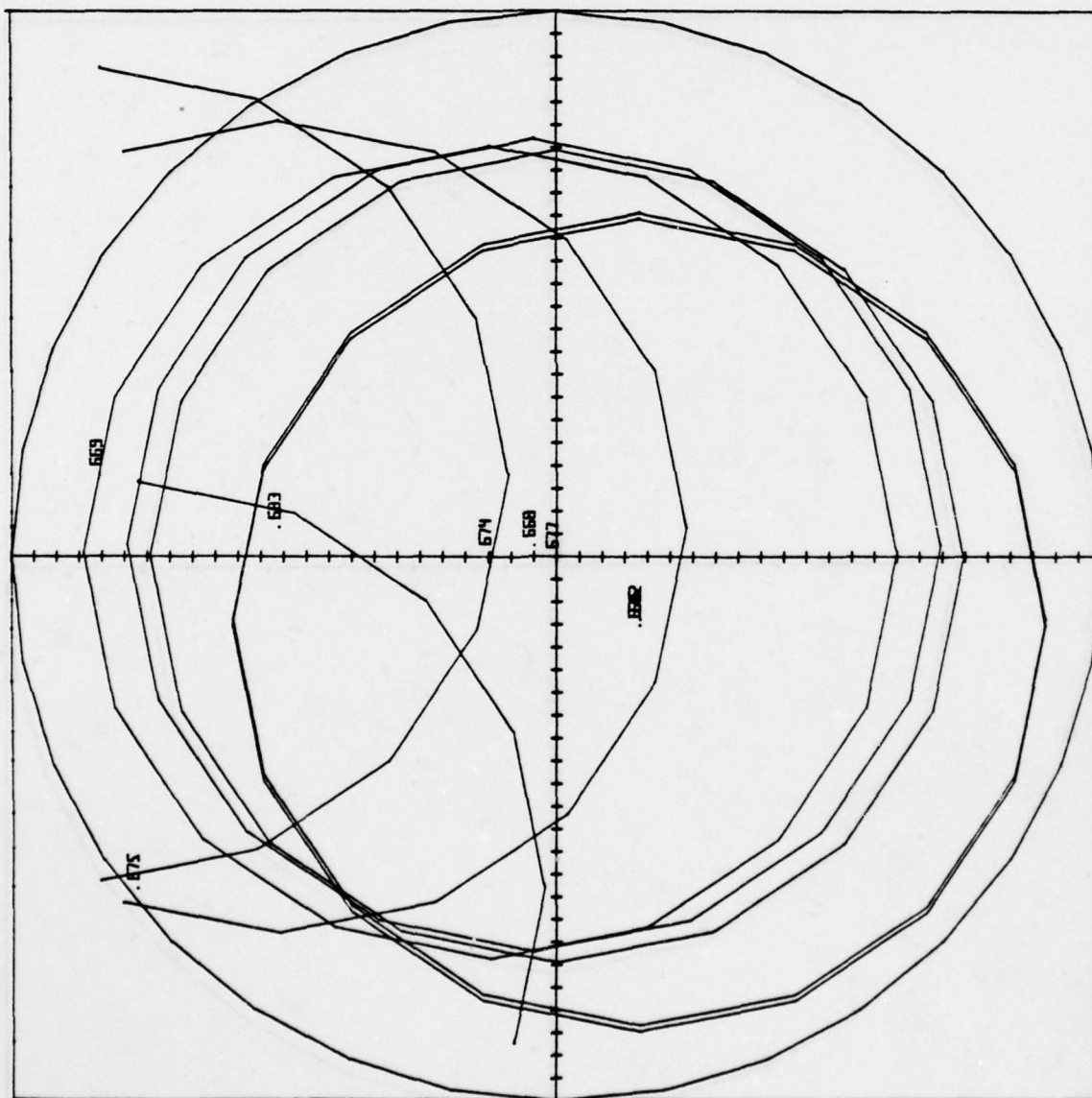
1E # 260 USED AS HORIZONTAL SITE

Radius # 260 WITHIN 0 100  
100 \*\*\*\*\*





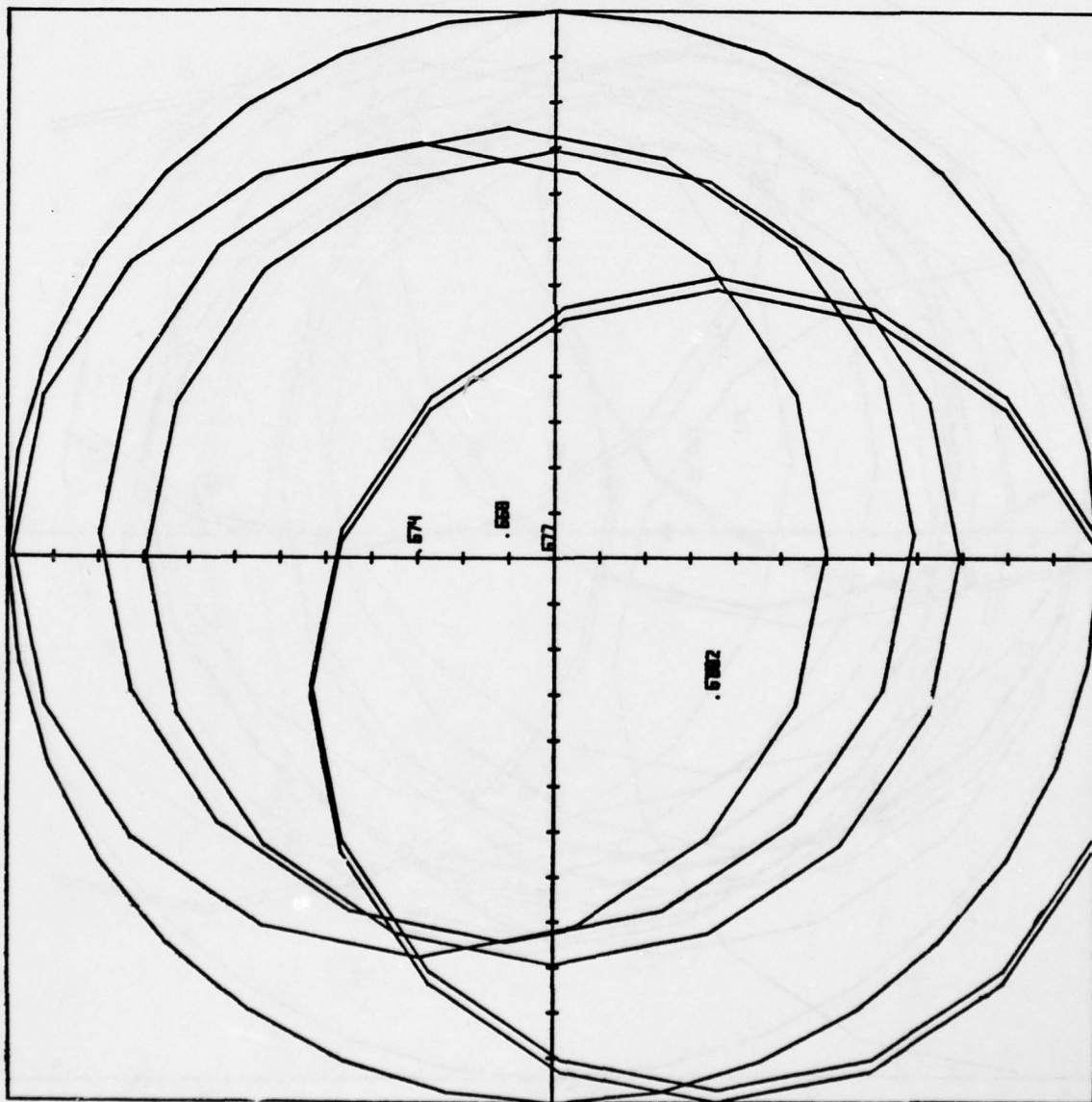
S E A  
SEATTLE/TACOMA, WASH.



00 4000 GIVE PHOTOS 89.44271919  
00 0000 PHOTOS 000 120  
# 675 0000 HS 000000 010E  
000 # 675 00000 000000 000  
000 # 674 00000 000000 000  
000 # 675 00000 14.6484848 000  
000 # 675 00000 117.0004746 000  
000 # 675 00000 23.6387430 000  
000 # 675 00000 0 000  
000 # 682 00000 22.0671234 000  
000 # 683 00000 61.4471537 000  
.....



SEA  
SEATTLE/TACOMA, WASH.



HEIGHT 1000 GIVES RADIUS 44.72135  
SIZE OF AREA <RADIUS <NN> 60  
FILE # 677 USED AS NOMINAL SITE  
RADAR # 668 WITHIN 5.66357325 111  
RADAR # 674 WITHIN 14.63846848 111  
RADAR # 676 WITHIN 23.65867480 111  
RADAR # 677 WITHIN 0 111  
RADAR # 682 WITHIN 22.8677234 111  
\*\*\*\*\* \*\*\*\*\* \*\*\*\*\*



# 10-106-10000 CITE

100000	4	42	010010	1.3, 46, 95, 372	1
100000	4	43	010010	400, 906, 1519	1
100000	4	44	010010	114, 460, 1519	1
100000	4	47	010010	91, 043, 360, 648	400
100000	4	48	010010	91, 054, 360, 648	400
100000	4	49	010010	91, 054, 360, 648	400
100000	4	50	010010	91, 054, 360, 648	400
100000	4	53	010010	61, 253, 293, 14	400
100000	4	56	010010	61, 253, 293, 14	400
100000	4	60	010010	61, 253, 293, 14	400
100000	4	62	010010	61, 253, 293, 14	400
100000	4	63	010010	61, 253, 293, 14	400
100000	4	68	010010	14, 268, 68, 115	400
100000	4	69	010010	14, 268, 68, 115	400
100000	4	70	010010	14, 268, 68, 115	400
100000	4	81	010010	32, 630, 36, 12	400
100000	4	82	010010	32, 630, 36, 12	400
100000	4	83	010010	113, 679, 140, 2	400
100000	4	84	010010	85, 679, 34, 58	400
100000	4	86	010010	77, 9400, 7119	400
100000	4	87	010010	77, 9400, 9085	400
100000	4	89	010010	24, 1, 56, 010	400
100000	4	90	010010	24, 1, 4, 94, 77	400
100000	4	93	010010	10, 74, 2, 2, 42	400
100000	4	94	010010	10, 74, 2, 2, 42	400
100000	4	95	010010	10, 74, 2, 2, 42	400
100000	4	103	010010	306, 6, 3, 3, 145	400
100000	4	104	010010	306, 6, 3, 3, 145	400
100000	4	113	010010	35, 3, 67, 384	1
100000	4	114	010010	50, 67, 38, 360	1
100000	4	115	010010	12, 308, 6, 2	1
100000	4	116	010010	41, 114, 98, 3	1
100000	4	117	010010	32, 4, 4, 1, 62	1



FILE # 110 USED AS HOMING SITE

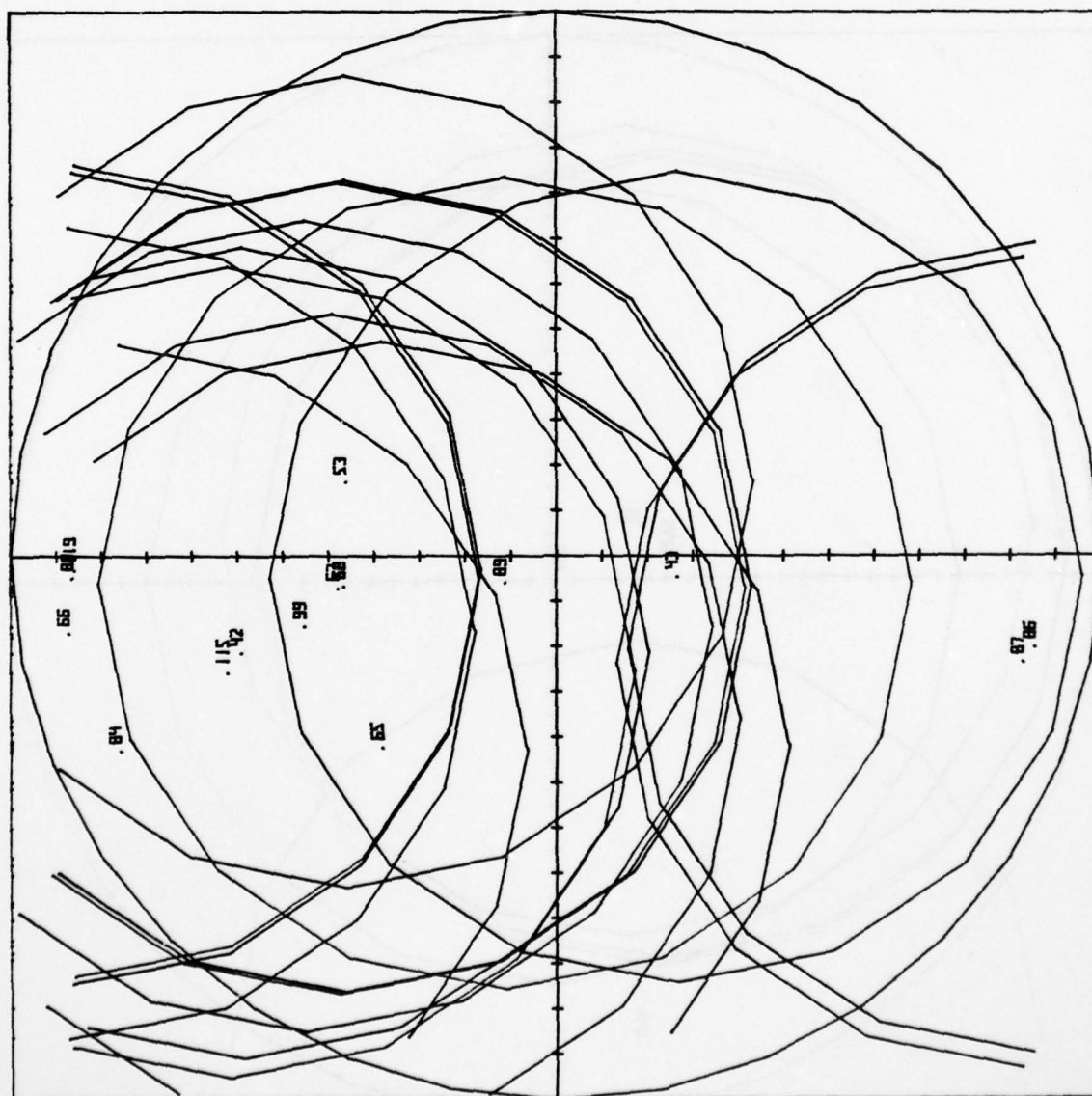
Frage	# 42	Wissen	# 43	Wissen	# 44
Frage	12, 448, 45, 372	100	40, 506, 151, 9	100	100
Frage	40, 506, 151, 9	100	100	100	100
Frage	61, 175, 115, 814	100	61, 175, 115, 814	100	100
Frage	61, 175, 115, 814	100	61, 175, 115, 814	100	100
Frage	14, 505, 65, 115	100	14, 505, 65, 115	100	100
Frage	14, 505, 65, 115	100	14, 505, 65, 115	100	100
Frage	14, 290, 57, 9	100	14, 290, 57, 9	100	100
Frage	32, 650, 36, 12	100	32, 650, 36, 12	100	100
Frage	32, 650, 36, 12	100	32, 650, 36, 12	100	100
Frage	43, 164, 94, 77	100	43, 164, 94, 77	100	100
Frage	43, 164, 94, 77	100	43, 164, 94, 77	100	100
Frage	10, 292, 6, 42	100	10, 292, 6, 42	100	100
Frage	50, 650, 80, 0	100	50, 650, 80, 0	100	100
Frage	50, 650, 80, 0	100	50, 650, 80, 0	100	100
Frage	41, 114, 9, 5	100	41, 114, 9, 5	100	100
Frage	50, 650, 80, 0	100	50, 650, 80, 0	100	100



FILE NAME	SIZE	USED	REMAINING	DATE
Volume # 42	01/01/00	35,150,500,457	001	
Volume # 43	01/01/00	35,500,500,597	001	
Volume # 44	01/01/00	35,950,499,697	001	
Volume # 45	01/01/00	36,399,499,797	001	
Volume # 46	01/01/00	36,849,499,897	001	
Volume # 47	01/01/00	37,299,499,997	001	
Volume # 48	01/01/00	37,749,499,997	001	
Volume # 49	01/01/00	38,199,499,997	001	
Volume # 50	01/01/00	38,649,499,997	001	
Volume # 51	01/01/00	39,099,499,997	001	
Volume # 52	01/01/00	39,549,499,997	001	
Volume # 53	01/01/00	39,999,499,997	001	
Volume # 54	01/01/00	40,449,499,997	001	
Volume # 55	01/01/00	40,899,499,997	001	
Volume # 56	01/01/00	41,349,499,997	001	
Volume # 57	01/01/00	41,799,499,997	001	
Volume # 58	01/01/00	42,249,499,997	001	
Volume # 59	01/01/00	42,699,499,997	001	
Volume # 60	01/01/00	43,149,499,997	001	
Volume # 61	01/01/00	43,599,499,997	001	
Volume # 62	01/01/00	44,049,499,997	001	
Volume # 63	01/01/00	44,499,499,997	001	
Volume # 64	01/01/00	44,949,499,997	001	
Volume # 65	01/01/00	45,399,499,997	001	
Volume # 66	01/01/00	45,849,499,997	001	
Volume # 67	01/01/00	46,299,499,997	001	
Volume # 68	01/01/00	46,749,499,997	001	
Volume # 69	01/01/00	47,199,499,997	001	
Volume # 70	01/01/00	47,649,499,997	001	
Volume # 71	01/01/00	48,099,499,997	001	
Volume # 72	01/01/00	48,549,499,997	001	
Volume # 73	01/01/00	48,999,499,997	001	
Volume # 74	01/01/00	49,449,499,997	001	
Volume # 75	01/01/00	49,899,499,997	001	
Volume # 76	01/01/00	50,349,499,997	001	
Volume # 77	01/01/00	50,799,499,997	001	
Volume # 78	01/01/00	51,249,499,997	001	
Volume # 79	01/01/00	51,699,499,997	001	
Volume # 80	01/01/00	52,149,499,997	001	
Volume # 81	01/01/00	52,599,499,997	001	
Volume # 82	01/01/00	53,049,499,997	001	
Volume # 83	01/01/00	53,499,499,997	001	
Volume # 84	01/01/00	53,949,499,997	001	
Volume # 85	01/01/00	54,399,499,997	001	
Volume # 86	01/01/00	54,849,499,997	001	
Volume # 87	01/01/00	55,299,499,997	001	
Volume # 88	01/01/00	55,749,499,997	001	
Volume # 89	01/01/00	56,199,499,997	001	
Volume # 90	01/01/00	56,649,499,997	001	
Volume # 91	01/01/00	57,099,499,997	001	
Volume # 92	01/01/00	57,549,499,997	001	
Volume # 93	01/01/00	57,999,499,997	001	
Volume # 94	01/01/00	58,449,499,997	001	
Volume # 95	01/01/00	58,899,499,997	001	
Volume # 96	01/01/00	59,349,499,997	001	
Volume # 97	01/01/00	59,799,499,997	001	
Volume # 98	01/01/00	60,249,499,997	001	
Volume # 99	01/01/00	60,699,499,997	001	
Volume # 100	01/01/00	61,149,499,997	001	
Volume # 101	01/01/00	61,599,499,997	001	
Volume # 102	01/01/00	62,049,499,997	001	
Volume				



SJC  
SAN JOSE, CAL



HEIGHT 1000 GIVES RADIUS 44.72135  
SIZE OF AREA (RADIUS (NM)) 60

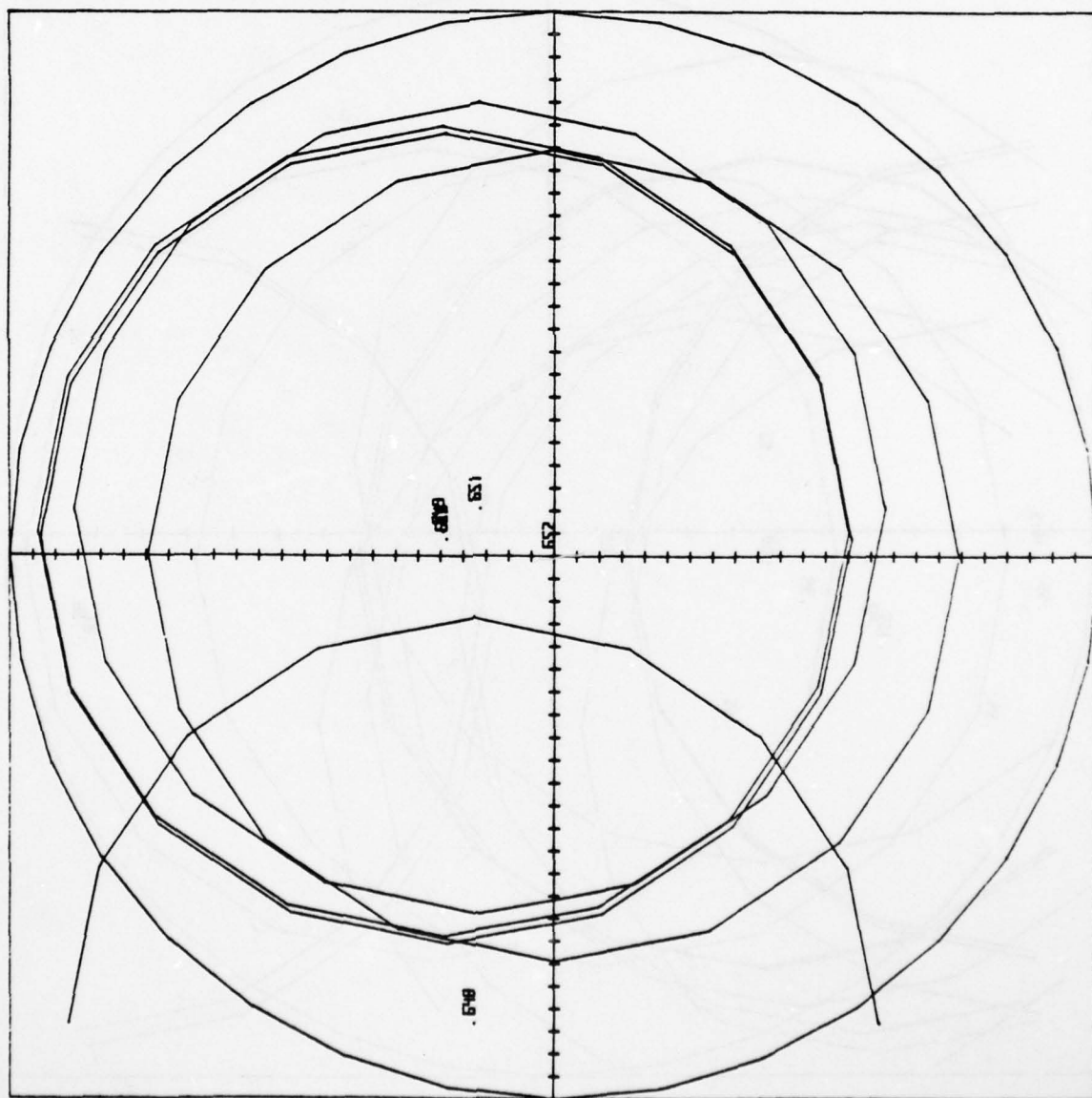
FILE NAME SJC USED AS NOMINAL SITE

RADAR # 42	WITHIN 36.15650947	NM
RADAR # 43	WITHIN 13.50154597	NM
RADAR # 53	WITHIN 24.5269408	NM
RADAR # 65	WITHIN 28.42785979	NM
RADAR # 66	WITHIN 54.3222552	NM
RADAR # 67	WITHIN 24.19843484	NM
RADAR # 68	WITHIN 23.48640322	NM
RADAR # 69	WITHIN 23.48640322	NM
RADAR # 80	WITHIN 53.24908027	NM
RADAR # 81	WITHIN 53.24908027	NM
RADAR # 84	WITHIN 52.51749292	NM
RADAR # 86	WITHIN 53.62460189	NM
RADAR # 87	WITHIN 52.73201557	NM
RADAR # 89	WITHIN 6.333843820	NM
RADAR # 93	WITHIN 28.66680518	NM
RADAR # 94	WITHIN 28.66680518	NM
RADAR # 113	WITHIN 30.42346436	NM
RADAR # 115	WITHIN 38.28399514	NM
RADAR # 119	WITHIN 52.95309312	NM

\*\*\*\*\* \*\*\*\*\*



S L C  
SALT LAKE CITY, UTAH

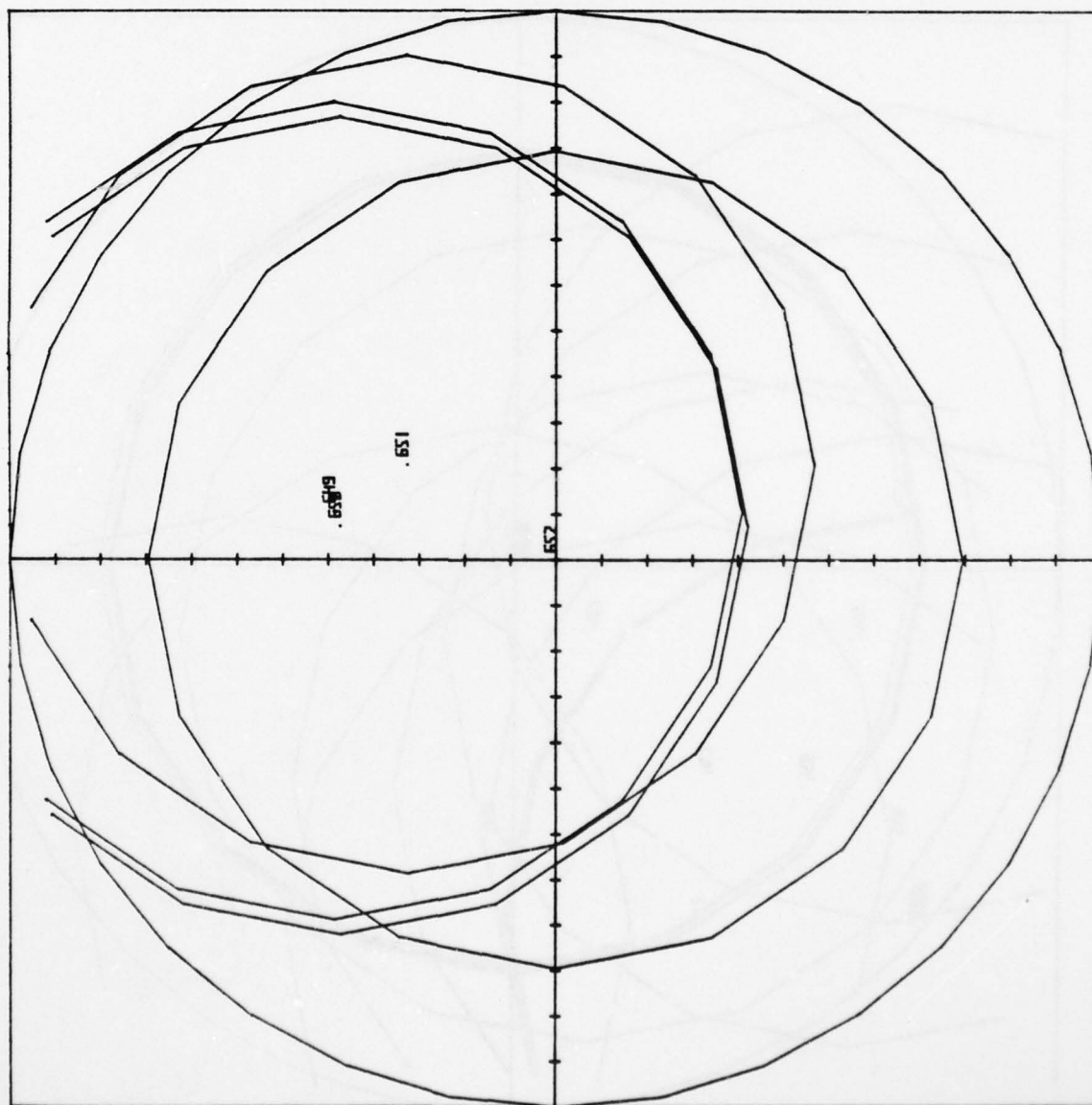


CALL 4000 0.111 0.0010 0.0010 0.0010  
 1. OF 0.0010 0.0010 0.0010 0.0010  
 E # 0.0010 0.0010 0.0010 0.0010  
 0.0010 # 0.0010 0.0010 0.0010 0.0010  
 0.0010 # 0.0010 0.0010 0.0010 0.0010  
 0.0010 # 0.0010 0.0010 0.0010 0.0010  
 0.0010 # 0.0010 0.0010 0.0010 0.0010



S L C  
SALT LAKE CITY, UTAH

1000 1000 LIVES 44.7212  
ZE OF RECH 4000 60  
E # 652 USED H3 NORMAL SITE  
GROUP # 649 WITHIN 24.9081879  
GROUP # 650 WITHIN 23.4599311  
GROUP # 651 WITHIN 19.35101302  
GROUP # 652 WITHIN 0 NN  
... \*\*\*\*\*





AD-A061 948

FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFIC--ETC F/G 17/7  
FAA BCAS CONCEPT. VOLUME IIIA. APPENDICES A-E, (U)  
APR 78 E J KOENKE

UNCLASSIFIED

FAA-EM-78-5-III-A

NL

4 OF 5  
AD  
A061 948







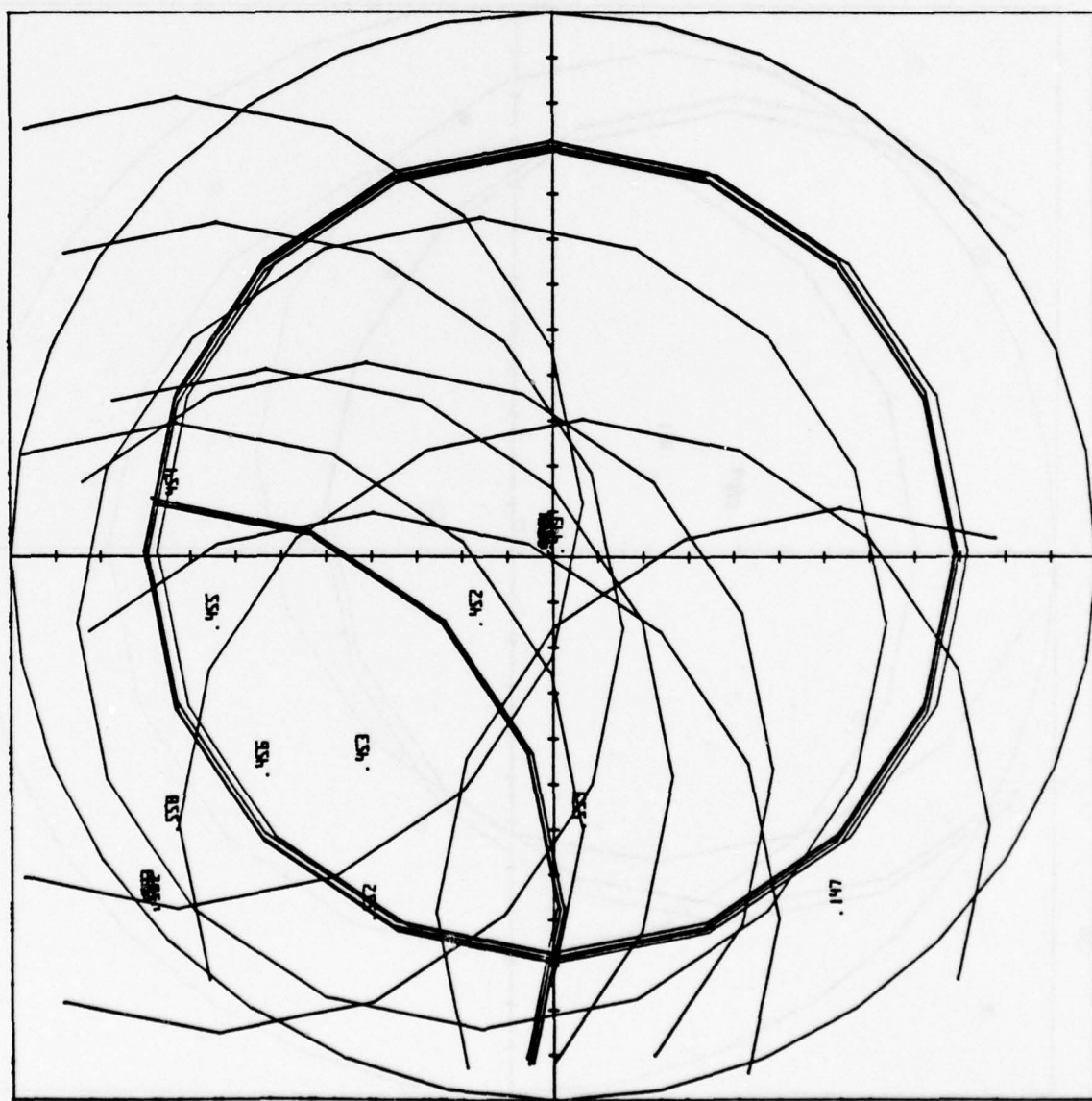


SRDS  
NAFEC

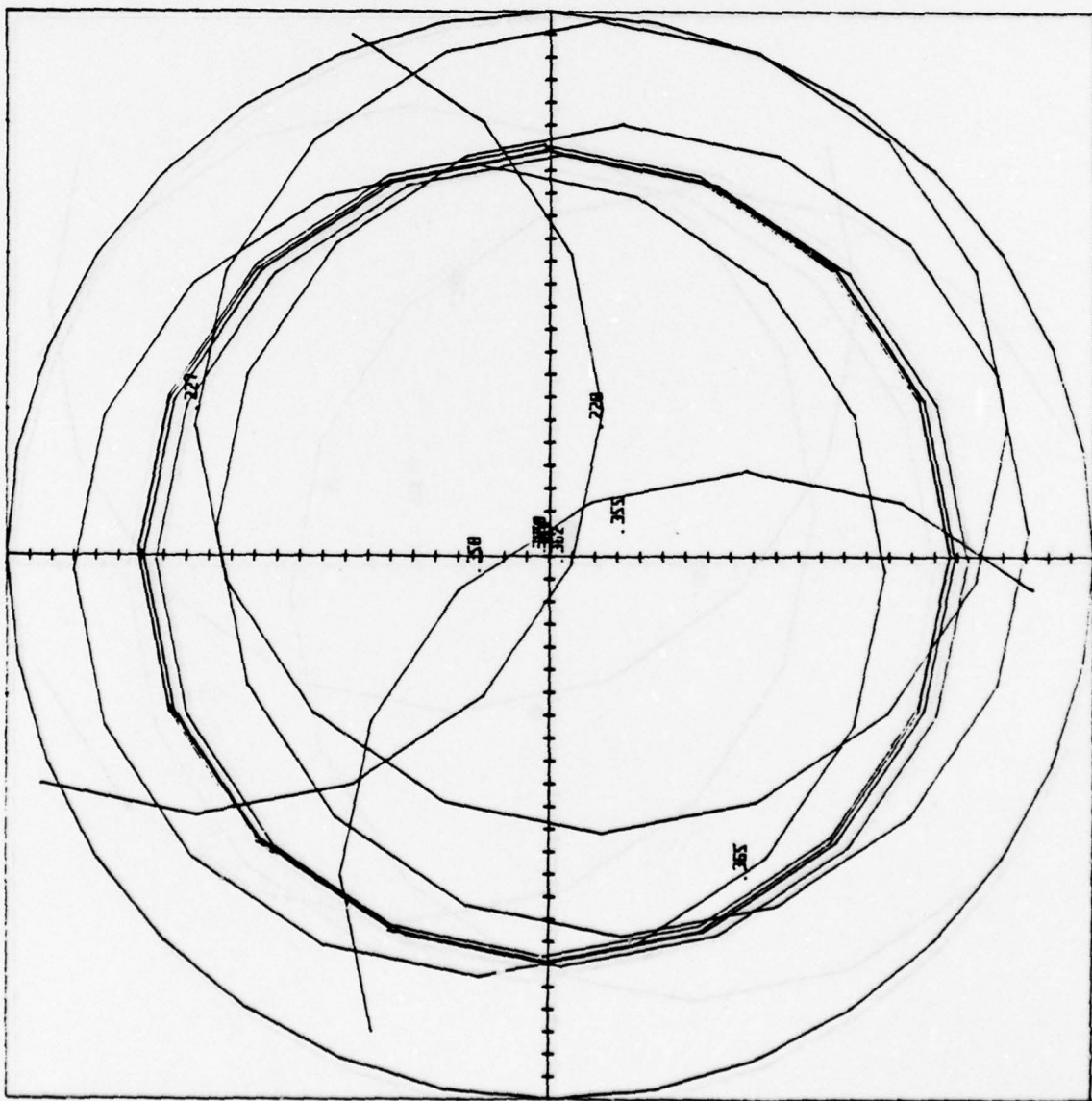
IN UNIT 1000 GIVE RADII 44.721 4555  
SIZE OF AREA RADII 400 60

LE # 447 USED AS BOUNDARY SITE

PROBE # 147	WITHIN 50.5449212	H
PROBE # 446	WITHIN 1.118823749	H
PROBE # 447	WITHIN 0	H
PROBE # 448	WITHIN 0.753229264	H
PROBE # 449	WITHIN 1.262787104	H
PROBE # 450	WITHIN 1.118823749	H
PROBE # 451	WITHIN 0.435078277	H
PROBE # 452	WITHIN 10.8446006	H
PROBE # 453	WITHIN 31.06879627	H
PROBE # 454	WITHIN 41.86136763	H
PROBE # 455	WITHIN 7.84962032	H
PROBE # 456	WITHIN 27.6767888	H
PROBE # 552	WITHIN 44.5362963	H
PROBE # 553	WITHIN 29.75183026	H
PROBE # 554	WITHIN 51.2013142	H
PROBE # 561	WITHIN 58.75580688	H
PROBE # 562	WITHIN 53.30311916	H
PROBE # 563	WITHIN 58.51609536	H







STL  
ST. LOUIS, MO.

DATE 4/10/60 GIVE RADIUS 88.44-271919  
E OF RCH RADIUS 100 120

L # 361 USED AS NORMAL SITE

NAME # 227	WITHIN 84.35154753	RM
NAME # 228	WITHIN 86.73357584	RM
NAME # 229	WITHIN 17.00320469	RM
NAME # 230	WITHIN 15.13885002	RM
NAME # 231	WITHIN 1.72552594	RM
NAME # 232	WITHIN 0	RM
NAME # 233	WITHIN 2.934100188	RM
NAME # 234	WITHIN 0.03550029	RM
NAME # 235	WITHIN 1.17038008	RM
NAME # 236	WITHIN 80.9254187	RM
NAME # 237	WITHIN 80.9254187	RM
NAME # 238	WITHIN 80.9254187	RM
NAME # 239	WITHIN 80.9254187	RM
NAME # 240	WITHIN 80.9254187	RM
NAME # 241	WITHIN 80.9254187	RM
NAME # 242	WITHIN 80.9254187	RM
NAME # 243	WITHIN 80.9254187	RM
NAME # 244	WITHIN 80.9254187	RM
NAME # 245	WITHIN 80.9254187	RM
NAME # 246	WITHIN 80.9254187	RM
NAME # 247	WITHIN 80.9254187	RM
NAME # 248	WITHIN 80.9254187	RM
NAME # 249	WITHIN 80.9254187	RM
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NAME # 264	WITHIN 80.9254187	RM
NAME # 265	WITHIN 80.9254187	RM



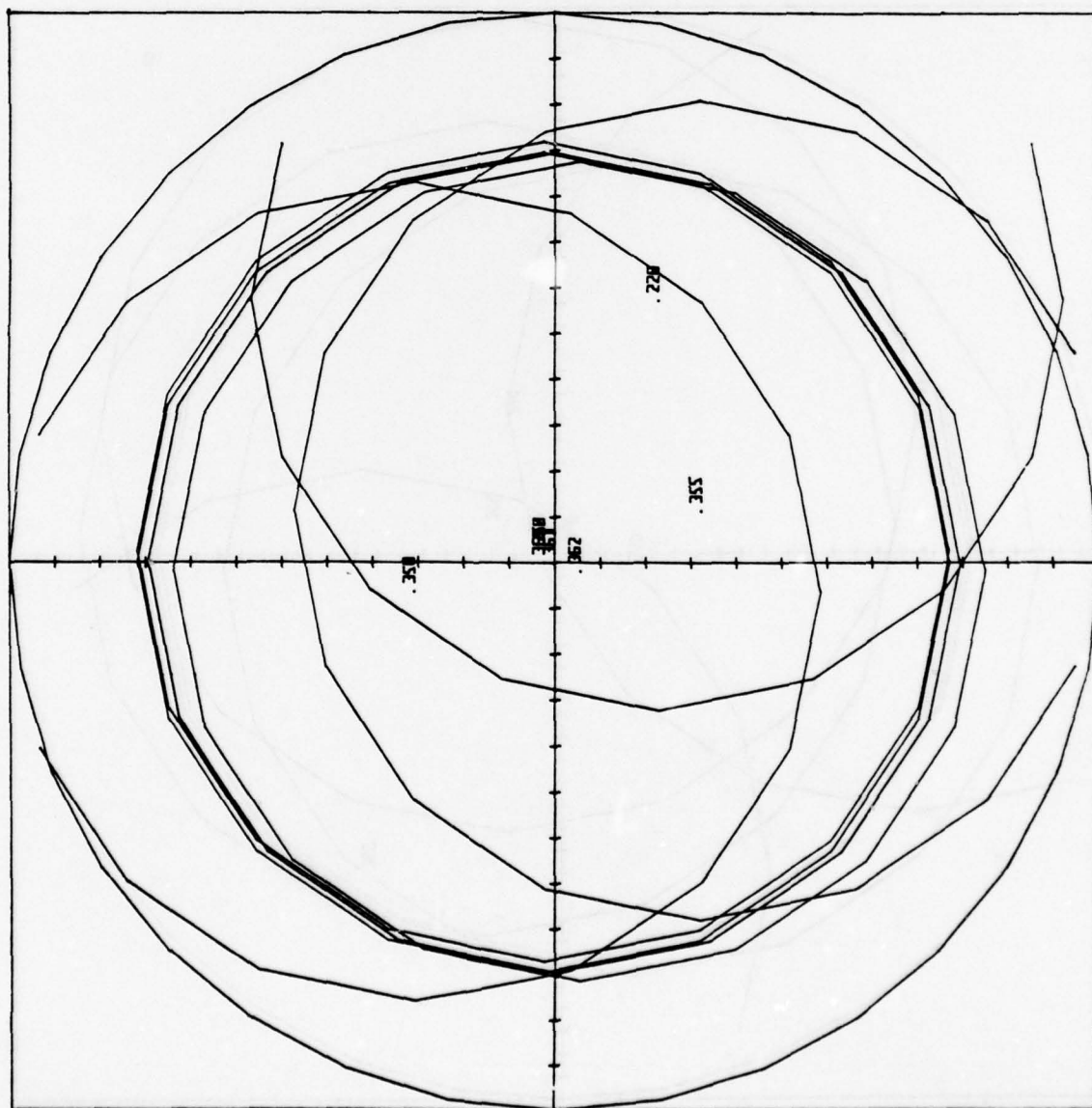
STL

ST. LOUIS, MO.

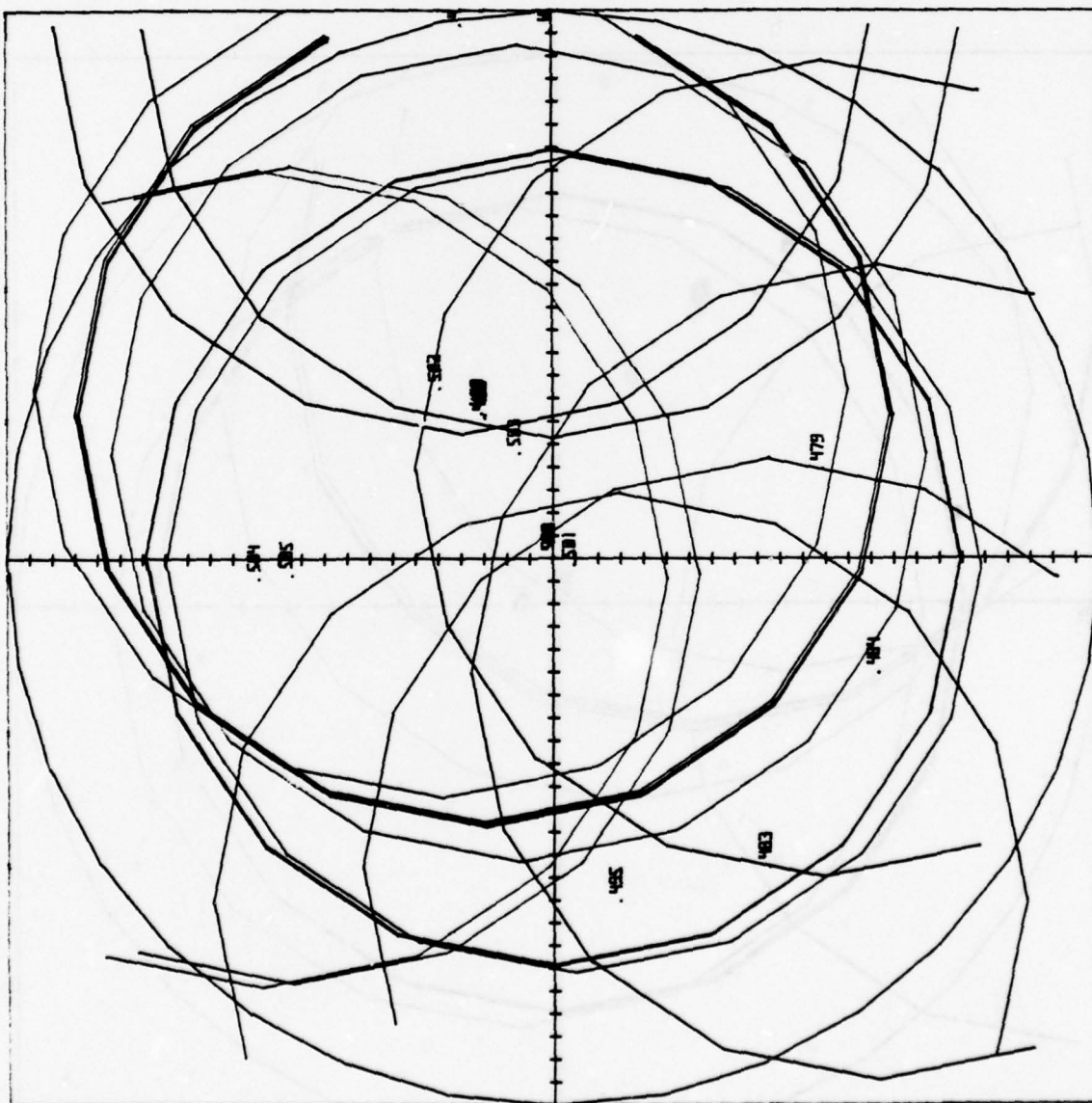
DATE: 1000 GIVES RADIOS 44,721.2  
 CL OF AREA (RADIOS (HRS) 60

FILE # 361 USED AS NORTHERN SITE

GROUP #	128	WIDTH	30.770-5784
GROUP #	155	WIDTH	17.064-70469
GROUP #	358	WIDTH	15.750-5083
GROUP #	360	WIDTH	1.265-2594
GROUP #	361	WIDTH	0
GROUP #	362	WIDTH	2.434-108188
GROUP #	363	WIDTH	0.053-20679
GROUP #	364	WIDTH	1.176-38903
...	.....	.....	.....







SYR  
SYRACUSE, N. Y.

HEIGHT 4000 GIVES RADIUS 89.44271918  
SIZE OF AREA <RADIUS (NM)> 120

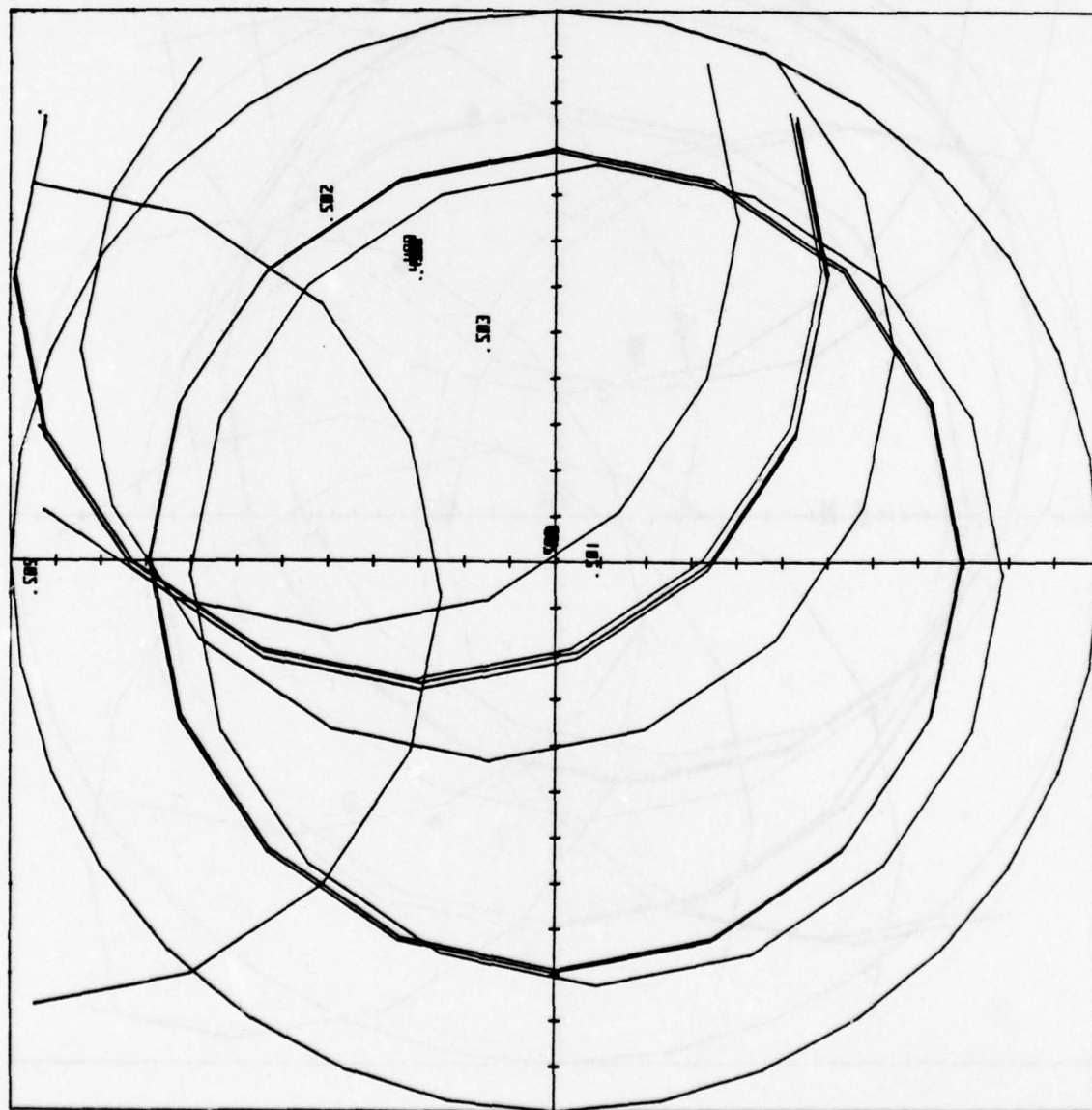
FILE # 500 USED AS NOMINAL SITE

RADAR # 478	WITHIN 115.7971344	NM
RADAR # 479	WITHIN 62.45255757	NM
RADAR # 483	WITHIN 82.6731906	NM
RADAR # 484	WITHIN 75.6026686	NM
RADAR # 486	WITHIN 34.71342096	NM
RADAR # 487	WITHIN 34.71342096	NM
RADAR # 488	WITHIN 35.36828756	NM
RADAR # 489	WITHIN 0.38420915	NM
RADAR # 495	WITHIN 76.51755441	NM
RADAR # 496	WITHIN 34.14205688	NM
RADAR # 497	WITHIN 118.3560905	NM
RADAR # 498	WITHIN 0	NM
RADAR # 500	WITHIN 0	NM
RADAR # 501	WITHIN 4.82145925	NM
RADAR # 502	WITHIN 44.56811083	NM
RADAR # 503	WITHIN 24.30306732	NM
RADAR # 504	WITHIN 64.51521386	NM
RADAR # 505	WITHIN 57.37071176	NM

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SYR  
SYRACUSE, N. Y.



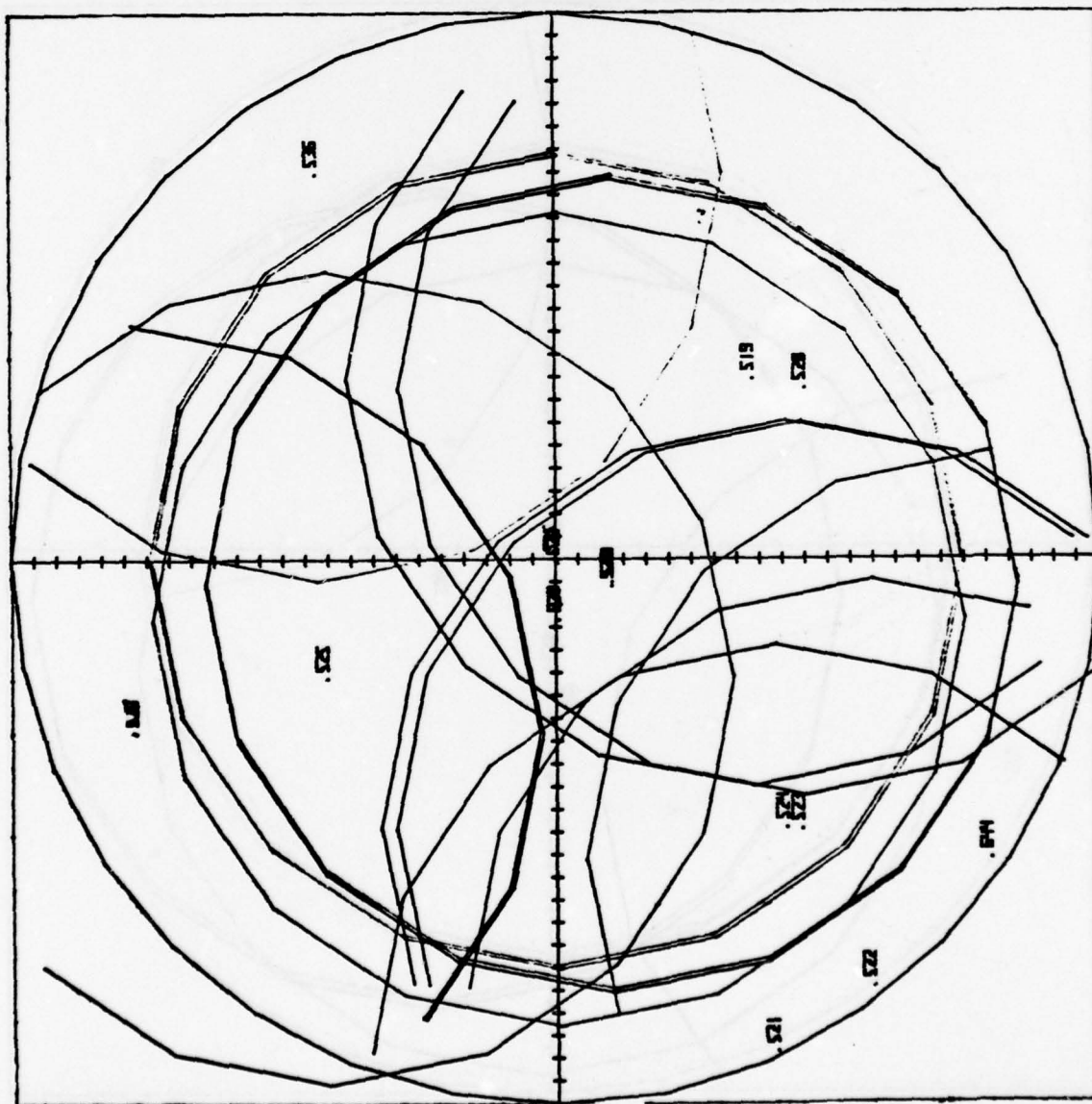
HEIGHT 1000 LIVES PROLOS 44.72135  
ZE OF MPER PROLOS 100.00000

LE # 500 USED AS INITIAL SITE

PROLOS # 480	WITHIN 34.71343046
PROLOS # 481	WITHIN 34.71343046
PROLOS # 482	WITHIN 34.71343046
PROLOS # 483	WITHIN 34.71343046
PROLOS # 484	WITHIN 34.71343046
PROLOS # 485	WITHIN 34.71343046
PROLOS # 486	WITHIN 34.71343046
PROLOS # 487	WITHIN 34.71343046
PROLOS # 488	WITHIN 34.71343046
PROLOS # 489	WITHIN 34.71343046
PROLOS # 490	WITHIN 34.71343046
PROLOS # 491	WITHIN 34.71343046
PROLOS # 492	WITHIN 34.71343046
PROLOS # 493	WITHIN 34.71343046
PROLOS # 494	WITHIN 34.71343046
PROLOS # 495	WITHIN 34.71343046
PROLOS # 496	WITHIN 34.71343046
PROLOS # 497	WITHIN 34.71343046
PROLOS # 498	WITHIN 34.71343046
PROLOS # 499	WITHIN 34.71343046
PROLOS # 500	WITHIN 34.71343046
PROLOS # 501	WITHIN 34.71343046
PROLOS # 502	WITHIN 34.71343046
PROLOS # 503	WITHIN 34.71343046
PROLOS # 504	WITHIN 34.71343046
PROLOS # 505	WITHIN 34.71343046
PROLOS # 506	WITHIN 34.71343046
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PROLOS # 512	WITHIN 34.71343046
PROLOS # 513	WITHIN 34.71343046
PROLOS # 514	WITHIN 34.71343046
PROLOS # 515	WITHIN 34.71343046
PROLOS # 516	WITHIN 34.71343046
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PROLOS # 526	WITHIN 34.71343046
PROLOS # 527	WITHIN 34.71343046
PROLOS # 528	WITHIN 34.71343046
PROLOS # 529	WITHIN 34.71343046
PROLOS # 530	WITHIN 34.71343046
PROLOS # 531	WITHIN 34.71343046
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PROLOS # 533	WITHIN 34.71343046
PROLOS # 534	WITHIN 34.71343046
PROLOS # 535	WITHIN 34.71343046
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PROLOS # 541	WITHIN 34.71343046
PROLOS # 542	WITHIN 34.71343046
PROLOS # 543	WITHIN 34.71343046
PROLOS # 544	WITHIN 34.71343046
PROLOS # 545	WITHIN 34.71343046
PROLOS # 546	WITHIN 34.71343046
PROLOS # 547	WITHIN 34.71343046
PROLOS # 548	WITHIN 34.71343046
PROLOS # 549	WITHIN 34.71343046
PROLOS # 550	WITHIN 34.71343046



T I K  
OKLAHOMA CITY, OKL.



HEIGHT 4800 GIVES RADIUS 89.4427191  
SIZE OF AREA (RADIUS (NM)) 120

FILE # 535 USED AS NOMINAL SITE

RADAR # 519	WITHIN 58.82899355	NM
RADAR # 520	WITHIN 66.53099908	NM
RADAR # 521	WITHIN 118.7694847	NM
RADAR # 522	WITHIN 117.2948049	NM
RADAR # 523	WITHIN 80.3992177	NM
RADAR # 524	WITHIN 77.9526729	NM
RADAR # 525	WITHIN 56.6470311	NM
RADAR # 526	WITHIN 99.818375	NM
RADAR # 527	WITHIN 109.3637278	NM
RADAR # 528	WITHIN 13.838379	NM
RADAR # 529	WITHIN 13.48493059	NM
RADAR # 530	WITHIN 13.838379	NM
RADAR # 531	WITHIN 13.36170288	NM
RADAR # 532	WITHIN 1.029542731	NM
RADAR # 533	WITHIN 13.36170288	NM
RADAR # 534	WITHIN 13.38831897	NM
RADAR # 535	WITHIN 8	NM
RADAR # 536	WITHIN 99.62643454	NM
RADAR # 644	WITHIN 116.5874385	NM

\*\*\*\*\*





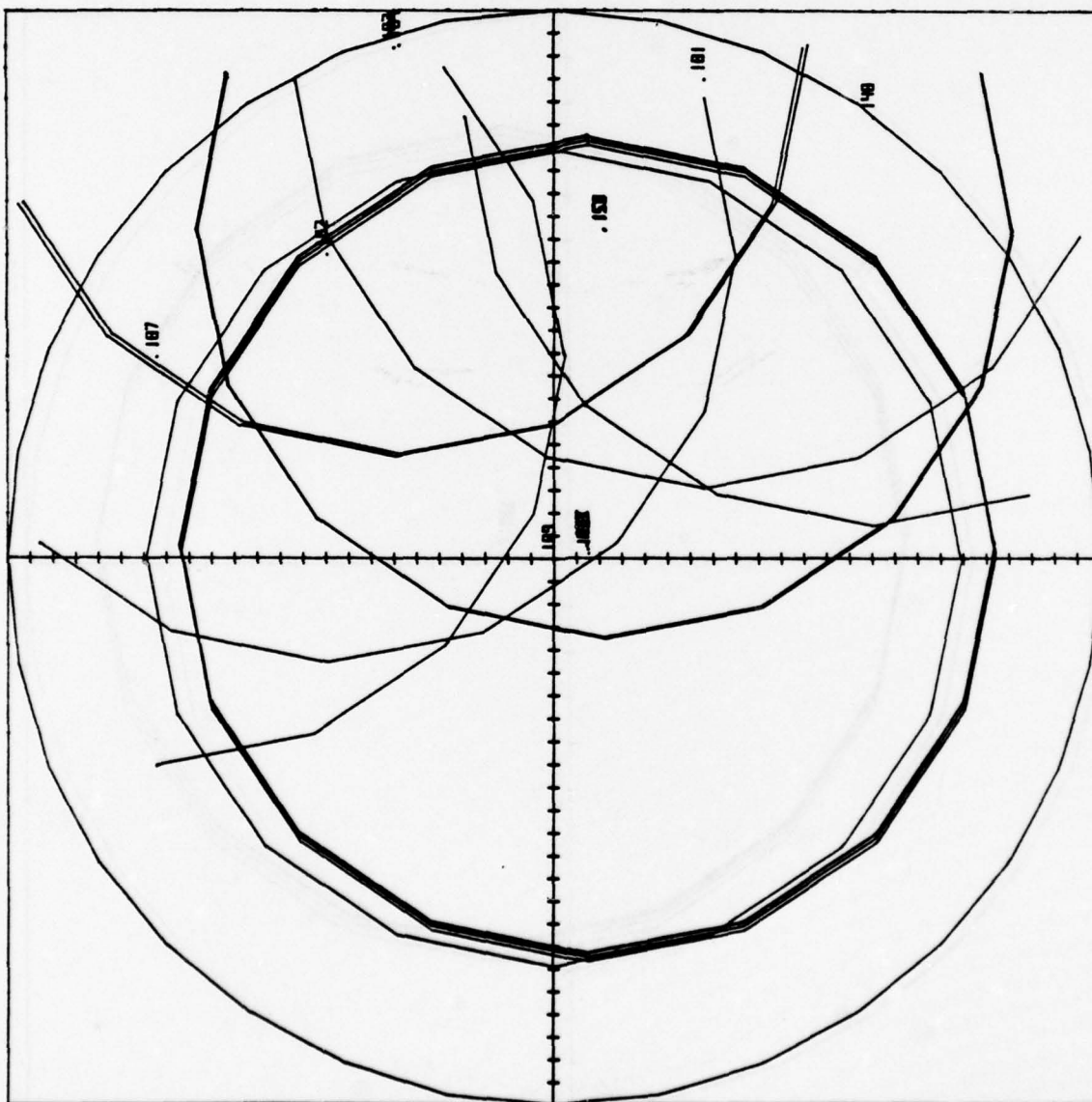


T P A  
TAMPA, FLORIDA  
McDILL

1001 4000 6173 PHOTOS 89-442-191  
L.E. OF DEEM PHOTOS 1001 120

ILE # 189 DEEP HS. DOWNDRL SITE

PHOTO # 140	117.4365844	111
PHOTO # 150	117.4365844	111
PHOTO # 151	117.4365844	111
PHOTO # 152	117.4365844	111
PHOTO # 175	117.4365844	111
PHOTO # 176	117.4365844	111
PHOTO # 177	117.4365844	111
PHOTO # 181	117.4365844	111
PHOTO # 182	117.4365844	111
PHOTO # 183	117.4365844	111
PHOTO # 184	117.4365844	111
PHOTO # 187	117.4365844	111
PHOTO # 188	117.4365844	111
PHOTO # 189	117.4365844	111



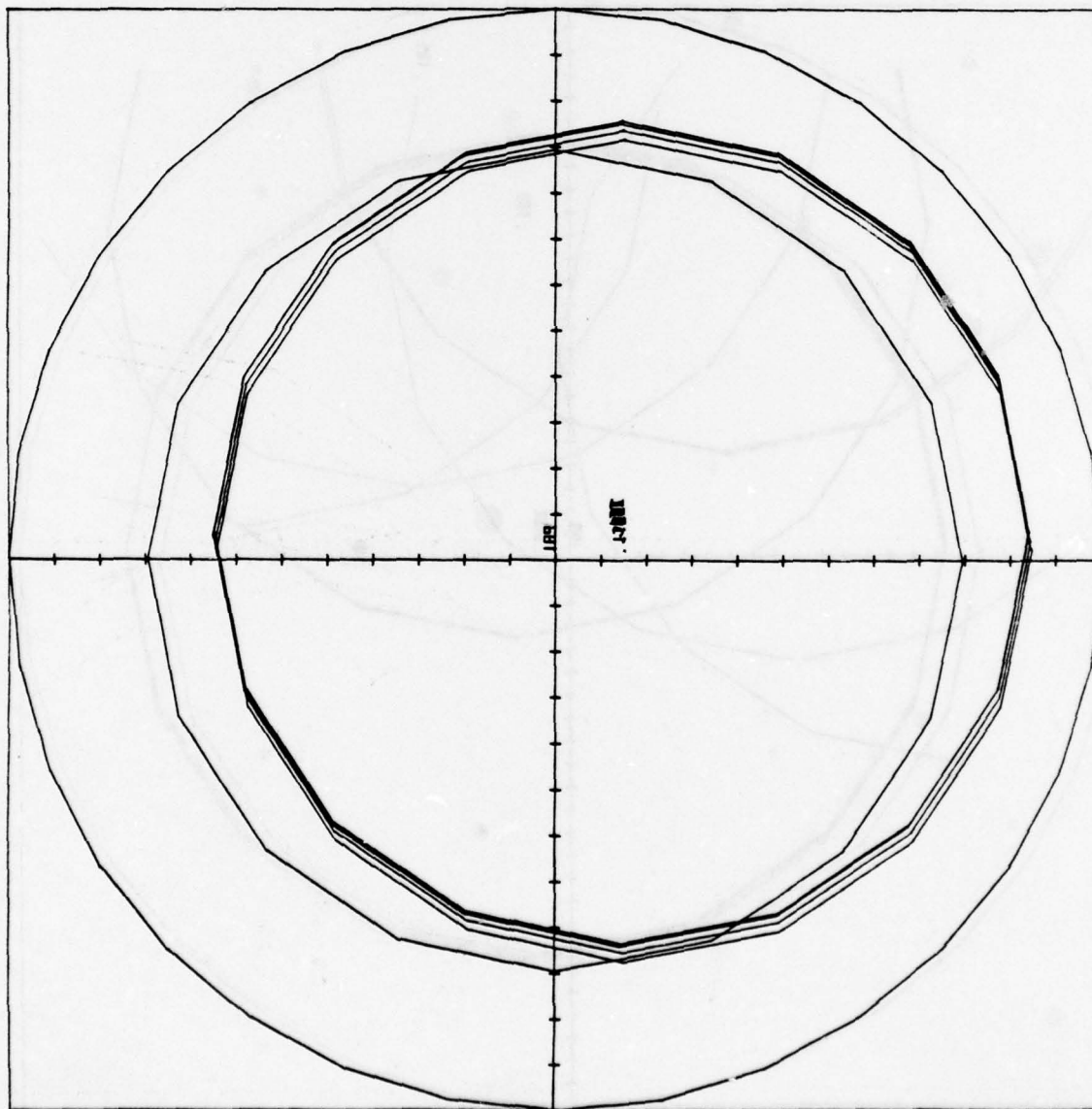


T P A  
TAMPA, FLORIDA  
McDILL

1001 1000 GIVES PABLOS 44.7513  
LE OF HERE PABLOS 1000 60

LE # 109 USED NO NORMAL SITE

PABLOS # 175 WITHIN 2.9536 00434  
PABLOS # 176 WITHIN 2.6867 0288  
PABLOS # 177 WITHIN 2.1140 0323  
PABLOS # 188 WITHIN 1.7505 0563  
PABLOS # 189 WITHIN 0.0000 0000  
\*\*\* \*\*\*\*\*



D-170

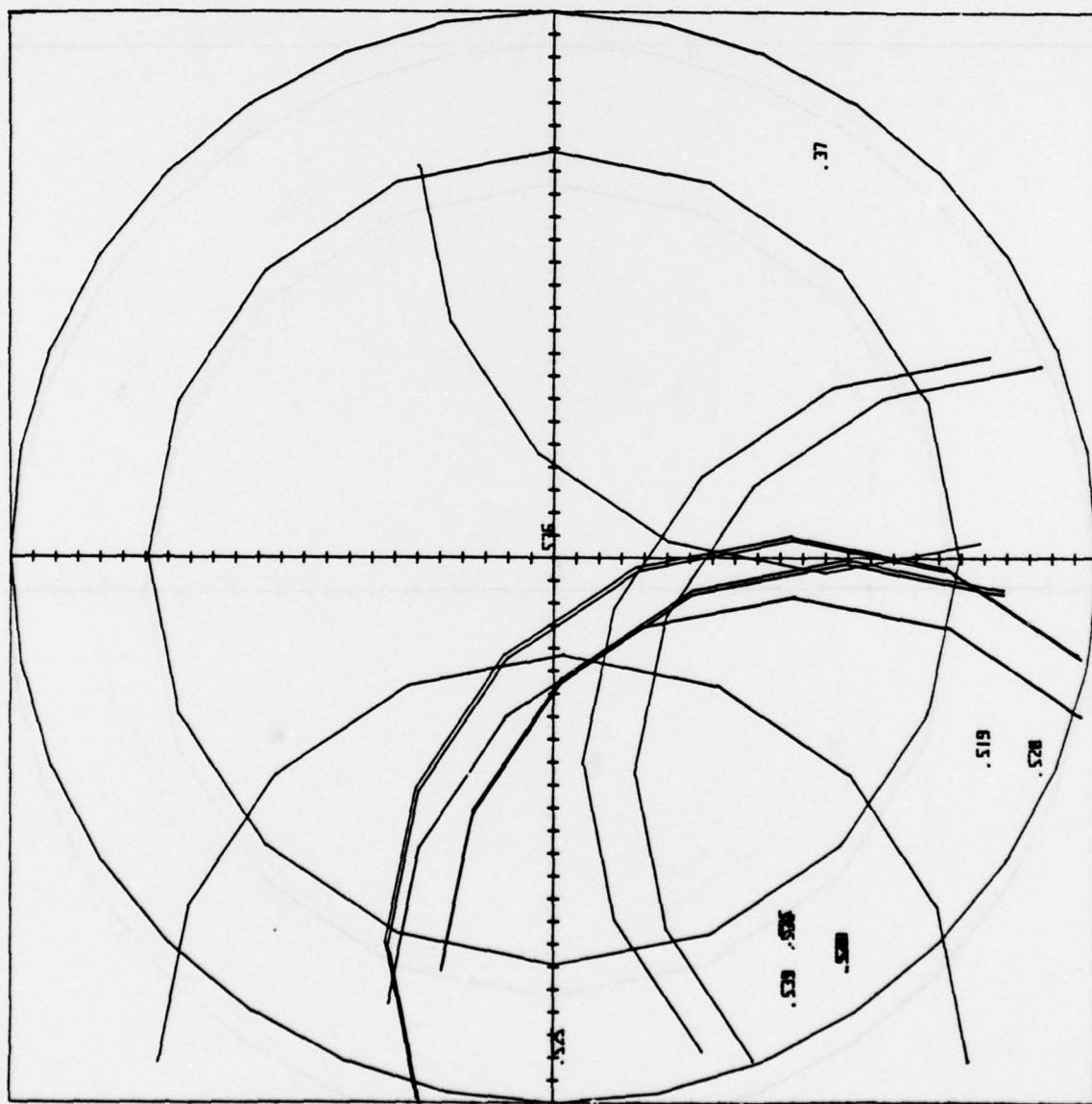


T U L  
TULSA, OKLAHOMA

60 4000 6195 60000 87.44271  
00 0000 60000 0000 1.00

W 5.36 USED AS NORMAL SITE

0000	# 57	00000	101.8525017	00
0000	# 519	00000	106.005176	00
0000	# 520	00000	117.3035143	00
0000	# 525	00000	110.327272	00
0000	# 528	00000	111.5004127	00
0000	# 529	00000	110.7815497	00
0000	# 530	00000	111.5201127	00
0000	# 531	00000	111.5200914	00
0000	# 532	00000	109.0413613	00
0000	# 533	00000	111.5200913	00
0000	# 534	00000	111.5200913	00
0000	# 535	00000	111.5200913	00
0000	# 536	00000	111.5200913	00
0000	# 537	00000	111.5200913	00
0000	# 538	00000	111.5200913	00
0000	# 539	00000	111.5200913	00
0000	# 540	00000	111.5200913	00
0000	# 541	00000	111.5200913	00
0000	# 542	00000	111.5200913	00
0000	# 543	00000	111.5200913	00
0000	# 544	00000	111.5200913	00
0000	# 545	00000	111.5200913	00
0000	# 546	00000	111.5200913	00
0000	# 547	00000	111.5200913	00
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0000	# 558	00000	111.5200913	00
0000	# 559	00000	111.5200913	00
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0000	# 582	00000	111.5200913	00
0000	# 583	00000	111.5200913	00
0000	# 584	00000	111.5200913	00
0000	# 585	00000	111.5200913	00
0000	# 586	00000	111.5200913	00
0000	# 587	00000	111.5200913	00
0000	# 588	00000	111.5200913	00
0000	# 589	00000	111.5200913	00
0000	# 590	00000	111.5200913	00
0000	# 591	00000	111.5200913	00
0000	# 592	00000	111.5200913	00
0000	# 593	00000	111.5200913	00
0000	# 594	00000	111.5200913	00
0000	# 595	00000	111.5200913	00
0000	# 596	00000	111.5200913	00
0000	# 597	00000	111.5200913	00
0000	# 598	00000	111.5200913	00
0000	# 599	00000	111.5200913	00
0000	# 600	00000	111.5200913	00

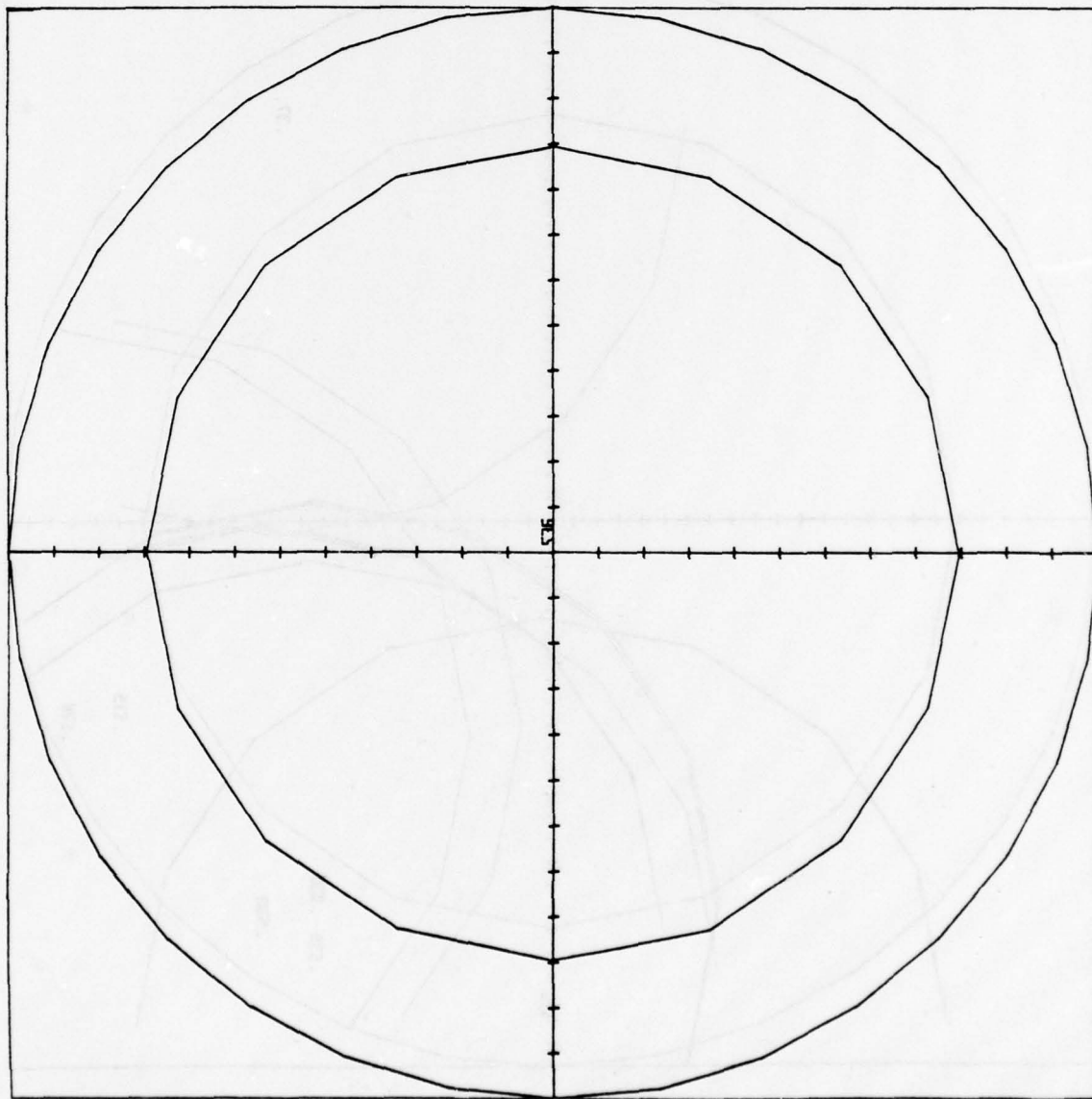




T U L

TULSA, OKLAHOMA

DATE 10000 GIVES PHOTOS 44.7213  
LE OF HELM PHOTOS 44.7213  
LE # 536 USED AS HORIZONTAL SITE  
PHOTO # 536 WITHIN 0 100  
\*\*\* \*\*\*\*\*





APPENDIX E  
BCAS ACCURACY ANALYSIS



## APPENDIX E

### BCAS ACCURACY ANALYSIS

#### E.1 INTRODUCTION

A universal tool capable of estimating the accuracy of any BCAS mode has been developed. This simulation is based on "covariance analysis" as opposed to "Monte-Carlo analysis" and as such utilizes much less computer time. This simulation was used to perform accuracy analysis on over 100 possible BCAS modes and to investigate both target and radar singularities which occur in certain modes of operation. The results of these analyses were used to assist in the selection of the recommended BCAS concept.

#### E.2 DESCRIPTION OF THE SIMULATION

The mathematical approach used to develop the simulation tool is based on linearization of the basic equations required to solve for target range and bearing relative to BCAS. The basic equations which need to be solved are given by

$$\tau_1 = \rho_{1T} + \rho_{0T} - \rho_{10} \quad (E-1)$$

$$\rho_{10} = \rho_{1T} \cos \Delta \alpha_1 - \rho_{0T} \cos (\beta - \alpha_{10}) \quad (E-2)$$

$$\rho_{1T} \sin \Delta \alpha_1 = \rho_{0T} \sin (\beta - \alpha_{10}) \quad (E-3)$$



and the geometry for which these equations apply is illustrated in Figure E-1.

Note that these equations are valid only for a two-dimensional analysis, but the results of this two-dimensional analysis have been compared with a complete three-dimensional Monte-Carlo simulation of a specific mode of BCAS. This comparison of the two analytic methods showed equivalence of the approaches. Also note that a covariance analysis of the three-dimensional equations is also possible, but was not done as part of this work due to time limitations. This will be pursued at a later time.

Linearization of equations (E-1), (E-2), and (E-3) results in the following equation set:

$$\begin{bmatrix} -1 & 1 & 0 & 0 & -1 & 1 & 0 \\ -1 & \cos\Delta\alpha_1 & -\rho_{0T}^* & -\rho_{1T}^* & 0 & -\cos(\beta-\alpha_{10}) & \rho_{0T}^* \\ 0 & \sin\Delta\alpha_1 & \rho_{0T}^* & \rho_{1T}^* & 0 & -\sin(\beta-\alpha_{10}) & -\rho_{0T}^* \end{bmatrix} \begin{bmatrix} \delta\rho_{10} \\ \delta\rho_{1T} \\ \delta\alpha_{10} \\ \delta\Delta\alpha_1 \\ \delta\tau_1 \\ \delta\rho_{0T} \\ \delta\beta \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

(E-4)



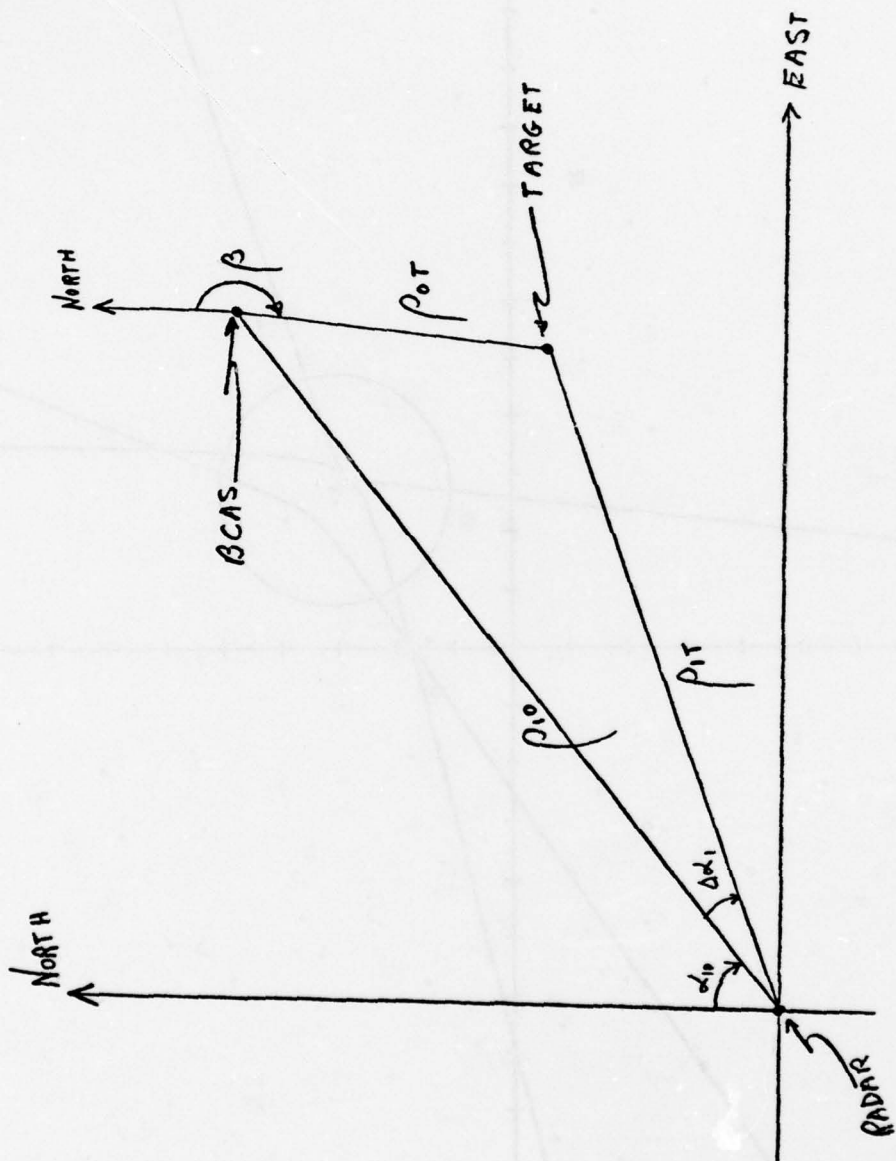
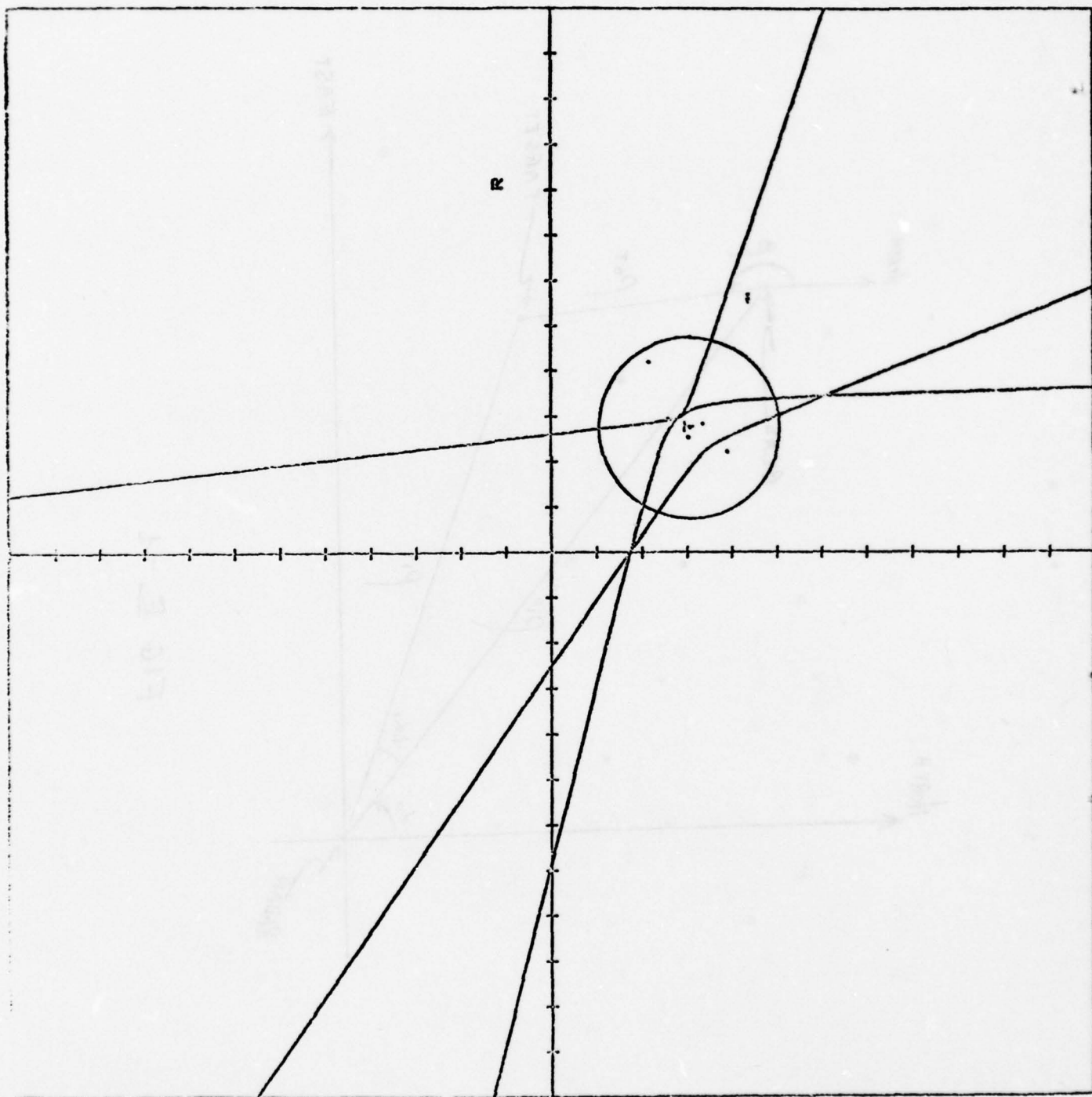


FIG E-1





E

E-4



Equation set (E-4) clearly represents three equations in seven unknowns. Thus, to obtain a deterministic solution, four variables must be specified or measured. An over-determined solution occurs when more than four variables are measured.

The total number of possible modes of BCAS can then be calculated from

$$N = C_4^7 + C_5^7 + C_6^7 + C_7^7 \quad (E-5)$$

so that  $N = 64$ .

The simulation program "SINGLE" has the capability of analyzing any of the 64 possible solutions for any radar/BCAS/target geometry. The technique used is to form the appropriate matrix equation from (E-4) in the form

$$A \{\delta x\} = B \{\delta y\} \quad (E-6)$$

where  $\{\delta x\}$  are the unknown variables and  $\{\delta y\}$  are the measured variables. The solution of (E-6) in general is given by

$$\delta x = [A^T A]^{-1} A^T B \delta y \quad (E-7)$$

The covariance matrix of the unknowns is thus related to the covariance matrix of the measurements by



$$P = K M K^T \quad (E-8)$$

where

$$\left. \begin{aligned} K &= [A^T A]^{-1} A^T B \\ M &= E (\delta y \delta y^T) \\ P &= E (\delta x \delta x^T) \end{aligned} \right\} \quad (E-9)$$

Given  $P$ , the main diagonal elements are the variances of the unknowns.

As an example, suppose a BCAS mode which measures  $\rho_{10}$ ,  $\alpha_{10}$ ,  $\Delta\alpha_1$  and  $\tau_1$ . Under this assumption,

$$\delta y = \begin{pmatrix} \delta\rho_{10} \\ \delta\alpha_{10} \\ \delta\Delta\alpha_1 \\ \delta\tau_1 \end{pmatrix} \quad \text{and} \quad x = \begin{pmatrix} \delta\rho_{1T} \\ \delta\rho_{0T} \\ \delta\beta \end{pmatrix}$$

$M$  is then formed by placing the variance of the measurement on the main diagonal so that

$$M = \begin{bmatrix} \sigma_{\rho_{10}}^2 & 0 & 0 & 0 \\ 0 & \sigma_{\alpha_{10}}^2 & 0 & 0 \\ 0 & 0 & \sigma_{\Delta\alpha_1}^2 & 0 \\ 0 & 0 & 0 & \sigma_{\tau_1}^2 \end{bmatrix}$$



K is solved for using specific geometry and then P is calculated using equation (E-8). The position uncertainty is then obtained from

$$\sigma_P = \left\{ \sigma_{\rho_{0T}}^2 + \rho_{0T}^2 \sigma_\beta^2 \right\}^{1/2} \quad (E-10)$$

This technique has been extended to two radars and is documented in program "DUAL." A third program called "DUAL-ATCRBS" has the capability of analyzing two-radar/two-target BCAS modes. Listings of these programs are presented as Attachment 1 of this appendix.

### E.3 RESULTS

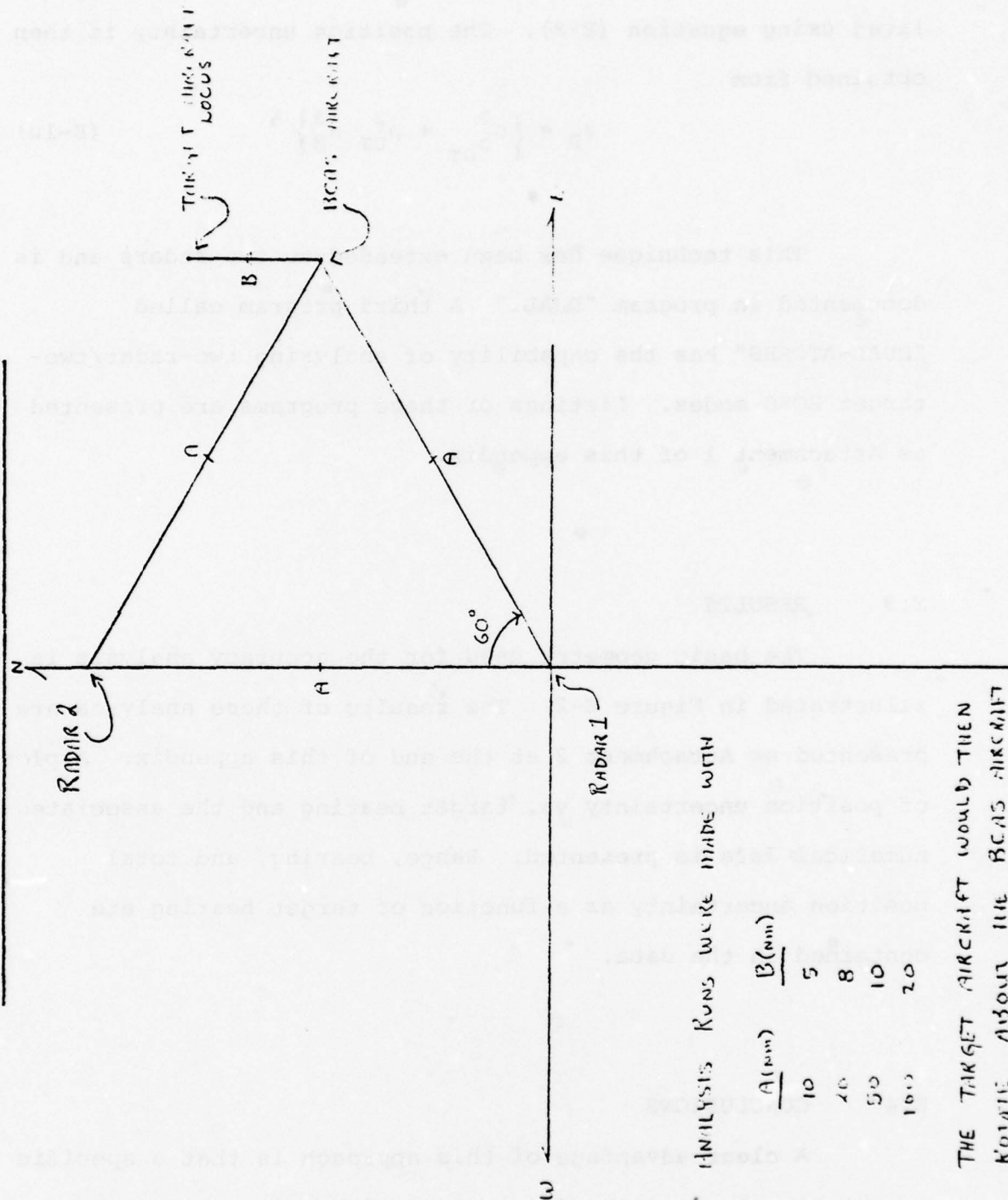
The basic geometry used for the accuracy analysis is illustrated in Figure E-2. The results of these analyses are presented as Attachment 2 at the end of this appendix. A plot of position uncertainty vs. target bearing and the associated numerical data is presented. Range, bearing, and total position uncertainty as a function of target bearing are contained in the data.

### E.4 CONCLUSIONS

A clear advantage of this approach is that a specific computational algorithm for a given BCAS mode does not have to be developed for purposes of accuracy analysis. A Monte-Carlo



FIG-2 BCAS ANALYSIS GEOMETRY





simulation has been developed which has the ability of evaluating a specific BCAS computational algorithm and has been used to check the validity of the covariance analysis. As expected, both results agree to a high degree of accuracy. The listing of the Monte-Carlo simulation is presented as Attachment 3 at the end of this appendix. Although this work is two-dimensional, it is relatively straightforward to extend to three dimensions. It is planned that this work will be done in the near future; it will be used to investigate the possibility of estimating target altitude when the target is equipped only with a Mode A transponder (without an encoding altimeter).



PROGRAM LISTINGS

FOR

SINGLE

DUAL

DUAL-ATCRBS

ATTACHMENT I



# SINGLE SITE COVARIANCE

```

>PIP U
>SET UIC=C120,1203
>PIP DK1:LI
DIIRECTORY DK1:C120,1203
22-MAR-78 08:56
PCOMP.FTN,15 5. 17-MAR-78 09:02
SINGLE.CMD,12 1. 17-MAR-78 09:02
SINGLE.TSK,26 61. 17-MAR-78 09:02
VECTOR.FTN,50 10. 17-MAR-78 09:02
DRIVER.FTN,115 23. 17-MAR-78 09:02
LIBR.FTN,24 6. 17-MAR-78 09:02
LIBR.OBJ,7 16. 17-MAR-78 09:02
VECTOR.OBJ,6 23. 17-MAR-78 09:02
DRIVER.OBJ,36 35. 17-MAR-78 09:02
PCOMP.OBJ,11 11. 17-MAR-78 09:02

```

TOTAL OF 191. BLOCKS IN 10. FILES

```

>PI TI:-DK1:SINGLE.CMD
PCR -- ILLEGAL FUNCTION
>PIP TI:-DK1:SINGLE.CMD
DK1:SINGLE-DK1:DRIVER,DK1:PCOMP,DK1:LIBR,DK1:VECTOR
/
LIBR-FORRES:RO
//
>

```







```

CALL LATERL(RHOV10,DUV10)
CALL UNIT(DUV10,EUV10)
CALL CROSS(UNITX,EUV10,TEMPU)
SALEF1=TEMPU(3)
CALL DOT(UNITX,EUV10,TEMP)
CALFIT=TEMP
ALFIT=DATA2(SALEF1,CALFIT)
ALFITC=ALFIT*CONVDR

C----- COMPUTE POSITION OF <OUN> RELATIVE TO RADAR <2>
C
C
CALL SUB(RHOV10,RHOV12,RHOV20)

C----- COMPUTE RANGE OF <OUN> TO RADAR <2>
C
C
CALL DOT(RHOV20,RHOV20,RHO20)
RHO20=DSQRT(RHO20)

C----- COMPUTE AZIMUTH OF <OUN> TO RADAR <2>
C
C
CALL LATERL(RHOV20,DUV20)
CALL UNIT(DUV20,EUV20)
CALL CROSS(UNITX,EUV20,TEMPU)
SALEF20=TEMPU(3)
CALL DOT(UNITX,EUV20,TEMP)
CALF20=TEMP
ALF20=DATA2(SALEF20,CALF20)
ALF20C=ALF20*CONVDR

C----- COMPUTE POSITION OF <TARGET> RELATIVE TO RADAR <2>
C
C
CALL ADD(RHOV20,RHOV20,RHOV2T)

C----- COMPUTE RANGE OF <TARGET> TO RADAR <2>
C
C
CALL DOT(RHOV2T,RHOV2T,RHO2T)
RHO2T=DSQRT(RHO2T)

C----- COMPUTE AZIMUTH OF <TARGET> TO RADAR <2>
C
C
CALL LATERL(RHOV2T,DUV2T)
CALL UNIT(DUV2T,EUV2T)
CALL CROSS(UNITX,EUV2T,TEMPU)
SALEF2T=TEMPU(3)
CALL DOT(UNITX,EUV2T,TEMP)
CALF2T=TEMP
ALF2T=DATA2(SALEF2T,CALF2T)

C----- COMPUTE DIFFERENTIAL AZIMUTHS -----
C
C
CALL LATERL(RHOV10,DUV10)
CALL UNIT(DUV10,EUV10)
CALL CROSS(EUV10,EUV10,TEMPU)
SALEF1=TEMPU(3)
CALL DOT(EUV10,EUV10,TEMP)
CALF1=TEMP
ALF1=DATA2(SALEF1,CALF1)

C
CALL CROSS(EUV20,EUV2T,TEMPU)
SALEF2=TEMPU(3)
CALL DOT(EUV20,EUV2T,TEMP)
CALF2=TEMP

C----- COMPUTE DIFFERENTIAL TIME OF ARRIVAL -----
C
C
C----- COMPUTE DIFFERENTIAL BETA1 AND BETA2 ANGLES -----
C
C
DTOA1=RHO10+RHO2T-RHO10
DTOA2=RHO2T+RHO2T-RHO20

C----- COMPUTE DIFFERENTIAL BETA1 AND BETA2 ANGLES -----
C
C
CALL LATERL(RHOV12,DUV12)
CALL UNIT(DUV12,EUV12)
CALL CROSS(EUV10,EUV12,TEMPU)
SBETD1=TEMPU(3)
CALL DOT(EUV10,EUV12,TEMP)
CBETD1=TEMP
BETD1=DATA2(SBETD1,CBETD1)

C
G=-1.0D0
CALL MULT(EUV12,G,EUV12)
CALL CROSS(EUV12,EUV20,TEMPU)
SBETD2=TEMPU(3)
CALL DOT(EUV12,EUV20,TEMP)
CBETD2=TEMP
BETD2=DATA2(SBETD2,CBETD2)

C----- COMPUTE GAMMA <OUN> AND GAMMA <TARGET> -----
C
C
CALL MULT(EUV10,G,EUV10)
CALL MULT(EUV20,G,EUV20)
CALL CROSS(EUV20,EUV10,TEMPU)
SGAM0=TEMPU(3)
CALL DOT(EUV20,EUV10,TEMP)
CGAM0=TEMP
GAM0=DATA2(SGAM0,CGAM0)

C
CALL MULT(EUV2T,G,EUV2T)
CALL MULT(EUV1T,G,EUV1T)
CALL CROSS(EUV2T,EUV1T,TEMPU)
SGAMT=TEMPU(3)
CALL DOT(EUV2T,EUV1T,TEMP)
CGAMT=TEMP
GAMT=DATA2(SGAMT,CGAMT)

C----- COLUMN #1-----
C
C
COL(1,1)=-1.0D0
COL(2,1)=-1.0D0
COL(3,1)=0.0D0

C----- COLUMN #2-----
C
C
COL(1,2)=1.0D0
COL(2,2)=DCOS(ALF1)
COL(3,2)=DSIN(ALF1)

C----- COLUMN #3-----
C
C
COL(1,3)=0.0D0
COL(2,3)=-RHO2TDSIN(BETAX-ALF1)
COL(3,3)=RHO2TDCOS(BETAX-ALF1)

CALF20=TEMP
ALF20=DATA2(SALEF20,CALF20)
ICOS OF DIFF ALPHA 2

C----- COMPUTE DIFFERENTIAL TIME OF ARRIVAL -----
C
C
C----- COMPUTE DIFFERENTIAL BETA1 AND BETA2 ANGLES -----
C
C
DTOA1=RHO10+RHO2T-RHO10
DTOA2=RHO2T+RHO2T-RHO20

C----- COMPUTE DIFFERENTIAL BETA1 AND BETA2 ANGLES -----
C
C
CALL LATERL(RHOV12,DUV12)
CALL UNIT(DUV12,EUV12)
CALL CROSS(EUV10,EUV12,TEMPU)
SBETD1=TEMPU(3)
CALL DOT(EUV10,EUV12,TEMP)
CBETD1=TEMP
BETD1=DATA2(SBETD1,CBETD1)

C
G=-1.0D0
CALL MULT(EUV12,G,EUV12)
CALL CROSS(EUV12,EUV20,TEMPU)
SBETD2=TEMPU(3)
CALL DOT(EUV12,EUV20,TEMP)
CBETD2=TEMP
BETD2=DATA2(SBETD2,CBETD2)

C----- COMPUTE GAMMA <OUN> AND GAMMA <TARGET> -----
C
C
CALL MULT(EUV10,G,EUV10)
CALL MULT(EUV20,G,EUV20)
CALL CROSS(EUV20,EUV10,TEMPU)
SGAM0=TEMPU(3)
CALL DOT(EUV20,EUV10,TEMP)
CGAM0=TEMP
GAM0=DATA2(SGAM0,CGAM0)

C
CALL MULT(EUV2T,G,EUV2T)
CALL MULT(EUV1T,G,EUV1T)
CALL CROSS(EUV2T,EUV1T,TEMPU)
SGAMT=TEMPU(3)
CALL DOT(EUV2T,EUV1T,TEMP)
CGAMT=TEMP
GAMT=DATA2(SGAMT,CGAMT)

C----- COLUMN #1-----
C
C
COL(1,1)=-1.0D0
COL(2,1)=-1.0D0
COL(3,1)=0.0D0

C----- COLUMN #2-----
C
C
COL(1,2)=1.0D0
COL(2,2)=DCOS(ALF1)
COL(3,2)=DSIN(ALF1)

C----- COLUMN #3-----
C
C
COL(1,3)=0.0D0
COL(2,3)=-RHO2TDSIN(BETAX-ALF1)
COL(3,3)=RHO2TDCOS(BETAX-ALF1)

```







```

100 FORMAT(' INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)')
101 FORMAT(1H, ' DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) -->')
102 FORMAT(3F10.3)
103 FORMAT(1F10.3)
104 FORMAT(' INPUT COUNO POSITION RELATIVE TO RADAR (1)')
105 FORMAT(1H, ' DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->')
106 FORMAT(1H, ' DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->')
107 FORMAT(1H, ' INPUT (TARGET) POSITION RELATIVE TO COUN')
108 FORMAT(2F10.4)
109 FORMAT(' VECTOR RHOUI2 --> '3F10.3,/)
110 FORMAT(' VECTOR RHOUI8 --> '3F10.3,/)
111 FORMAT(1H, ' ANY CHANGES (V=1/N=2)-->')
112 FORMAT(1H, ' HOW MANY CHANGES -->')
113 FORMAT(1H, '15, CHANGE RHO ? ,')
114 FORMAT(1H, '15, CHANGE RHO ? ,')
115 FORMAT(1H, ' WANT TO SEE ERRMAT (V=1/2=N)-->')
116 FORMAT(' '14, '2F12.4)
117 FORMAT(' '14, '3F12.4)
118 FORMAT(' '14, '4F12.4)
119 FORMAT(' NUMBER OVER SD --> '110, '2F12.4)
120 FORMAT(1H, ' BETA START, INCREMENT (DEG) -->')
121 FORMAT(214)
122 FORMAT(14,3F12.4)
123 FORMAT(14)
124 FORMAT(' BETA RANGE BEARING CEP')
125 STOP, --END OF BCAS PROGRAM--
126 END

```



```

>FIP TI:=DK1PCOMP.FTH
C
C-----CALCULATE P MATRIX-----
C
+
+ SURROUTINE PCOMP(A,B,SIG,P,MIN,MAX,ID,
+ TEMP1,TEMP2,TEMP3,TEMP4,TEMP5,TEMP6,TEMP7)
+ DOUBLE PRECISION A(6,6),B(6,6),SIG(6,6),P(6,6)
+ DOUBLE PRECISION TEMP1(6,6),TEMP2(6,6),TEMP3(6,6)
+ DOUBLE PRECISION TEMP4(6,6),TEMP5(6,6),TEMP6(6,6)
+ DOUBLE PRECISION TEMP7(6,6),TEMP8(6,6)
C
CALL TRANS (A,TEMP1,3,MIN)
CALL MATRUL (TEMP1,A,TEMP2,MIN,3,MIN)
CALL MATRUL (TEMP2,MIN,TEMP8,0,ID)
CALL MATRUL (TEMP2,TEMP1,TEMP4,MIN,MIN,3)
CALL MATRUL (TEMP4,B,TEMP5,MIN,3,MAX)
CALL TRANS (TEMP5,TEMP6,MIN,MAX)
CALL MATRUL (TEMP5,SIG,TEMP7,MIN,MAX,MAX)
CALL MATRUL (TEMP7,TEMP6,P,MIN,MAX,MIN)
RETURN
END
C
C-----READ IN INPUTS-----
C
SUBROUTINE INPUT(K,L,S,MIN,MAX)
DIMENSION K(7),L(7)
DOUBLE PRECISION S(7),CONVNM,CONUDR
DATA CONVNM/6076.115D0/
DATA CONUDR/57.2957795131D0/
WRITE(5,101)
READ(5,1)MAX
MIN = 7-MAX
C
WRITE(5,105)
WRITE(5,106)
WRITE(5,107)
WRITE(5,108)
IF(MAX.EQ.4)READ(5,2)(K(I),I=1,4)
IF(MAX.EQ.5)READ(5,4)(K(I),I=1,5)
IF(MAX.EQ.6)READ(5,5)(K(I),I=1,6)
WRITE(5,1)(K(I),I=1,MAX)
C
C-----FORM MATRIX L-----
C
J=1
DO 10 I=1,MAX
L(K(I))-1
10
C
C-----READ IN ERRORS-----
C
DO 15 I=1,7
IF(L(I).EQ.0)GOTO 15
GOTO (201,202,203,204,205,206,207),I
201 WRITE(5,151)
GOTO 12
202 WRITE(5,152)
GOTO 12
203 WRITE(5,153)
GOTO 13
204 WRITE(5,154)
GOTO 13
205 WRITE(5,155)
GOTO 12
206 WRITE(5,156)
GOTO 12
207 WRITE(5,157)
GOTO 13
12 READ(5,3)S(I)
S(I)=S(I)/CONVNM
GOTO 15
13 READ(5,3)S(I)
S(I)=S(I)/CONUDR
15 CONTINUE
DO 20 I=1,7
IF(L(I).NE.0)GOTO 20
K(J+MAX)=I
J=J+1
CONTINUE
RETURN
FORMAT(14)
FORMAT(4I4)
FORMAT(10,4)
FORMAT(5I4)
FORMAT(6I4)
FORMAT(1H, ENTER NUMBER OF MEASUREMENTS -->)
FORMAT(1, 1..RHO10', 2..RHO11', 3..ALF10')
FORMAT(1, 4..ALFD1', 5..TAU1', 6..RHO0T', 7..BETA')
FORMAT(1H, ENTER NUMBERS -->)
FORMAT(1H, SIGMA RHO10 (FT) -->)
FORMAT(1H, SIGMA RHO11 (FT) -->)
FORMAT(1H, SIGMA ALF10 (DEG) -->)
FORMAT(1H, SIGMA ALFD1 (DEG) -->)
FORMAT(1H, SIGMA DT0A1 (FT) -->)
FORMAT(1H, SIGMA RHO0T (FT) -->)
FORMAT(1H, SIGMA BETA (DEG) -->)
END

```



E-17



```

UNIT-1.000
S-PSIN(AM2)
C-BCOS(AM2)
IF(DMS(S) .LT. 100-S1000) 10
RETURN
S-0.000
C-DSIGN(UNIT,C)
RETURN
C-0.000
S-DSIGN(UNIT,S)
RETURN
END

```

C  
 10  
 20  
 >



# DUAL SITE COVARIANCE

>SET UIC=C130,1303  
>PIP DK1: LI

DIRECTORY DK1:C130,1303  
22-MAR-78 09:00

DUAL.CMD,2	1:	17-MAR-78 09:02
PLOTDR.OBJ,2	32:	21-MAR-78 13:12
PCOMP2.OBJ,21	15:	17-MAR-78 09:02
DUAL.TSK,16	80:	17-MAR-78 09:08
PLOTDR.OBJ,1	32:	21-MAR-78 13:07
PCOMP2.FTN,26	7:	17-MAR-78 09:02
VECTOR.OBJ,7	23:	17-MAR-78 13:11
PLOTDR.FTN,4	20:	21-MAR-78 09:02
VECTOR.FTN,51	10:	17-MAR-78 13:15
DUALP.TSK,1	75:	21-MAR-78 09:02
LIBR2.OBJ,1	17:	17-MAR-78 13:13
DUALPLOT.CMD,2	1:	21-MAR-78 15:44
PLOT2.OBJ,1	32:	21-MAR-78 15:42
DRIVE2.OBJ,43	38:	17-MAR-78 09:02
DRIVE2.FTN,62	22:	17-MAR-78 09:02
LIBR2.FTN,3	7:	21-MAR-78 15:46
DUALP2.TSK,1	75:	21-MAR-78 15:44
DUALPLOT2.CMD,2	1:	21-MAR-78 15:44

TOTAL OF 508. BLOCKS IN 19. FILES

>PIP TI:=DK1:DUAL.CMD  
DK1:DUAL-DK1:DRIVE2,DK1:PCOMP2,DK1:LIBR2,DK1:VECTOR  
LIBR-FORRES:RO

>PIP TI:=DK1:DUALPLOT.CMD  
DK1:DUALP-DK1:PLOTDR,DK1:PCOMP2,DK1:LIBR2,DK1:VECTOR  
LIBR-FORRES:RO

>PIP TI:=DK1:DUALPLOT2.CMD  
DK1:DUALP2-DK1:PLOT2,DK1:PCOMP2,DK1:LIBR2,DK1:VECTOR  
LIBR-FORRES:RO



E-20



E-21



















```

PIP TI-DK1LIBR8.FTN
C-----
C-----THIS ROUTINE TRANSPOSES A KxL MATRIX
C-----NOTE: TA IS TRANSPOSED INTO TB
C-----
SUBROUTINE TRANS(TA,TB,K,L)
DOUBLE PRECISION TA(12,12),TB(12,12)
DO 10 I=1,L
DO 10 J=1,K
TB(I,J)=TA(J,I)
RETURN
END
C-----
SUBROUTINE MATRUL(TA,TB,TC,M,N,P)
INTEGER P
DOUBLE PRECISION TA(12,12),TB(12,12),TC(12,12)
CALL ZERO(TC,M,P)
DO 10 I=1,M
DO 10 J=1,N
TC(I,J)=TA(I,J)+TB(I,J)
RETURN
END
C-----
SUBROUTINE ZEROIT(K,L)
DOUBLE PRECISION T(12,12)
DO 10 I=1,K
DO 10 J=1,L
T(I,J)=0.000
RETURN
END
C-----
SUBROUTINE MATINU(A,M1,M2,10,DETERM)
DOUBLE PRECISION A(12,12),B(12,12),DETERM,SWAP,PIVOT,T,APMAX
DIMENSION INDEX(12,3)
EQUIVALENCE (IROW,JROW), (ICOLUMN,JCOLUMN), (APMAX, T, SWAP)
C-----
M=M1
N=M2
DETERM=1.000
DO 20 J=1,N
INDEX(J,3)=0
DO 50 I=1,M
-->INITIALIZATION
APMAX=0.000
IF INDEX(J,3)-1) 60,105,60
DO 100 K=1,N
IF INDEX(K,3)-1) 80,100,715
IF (APMAX - DABS(A(J,K))) 85,100,100
IROW=J
ICOLUMN=K
APMAX=DABS(A(J,K))
CONTINUE
INDEX(1,1)=IROW
INDEX(1,2)=ICOLUMN
C-----
-->SEARCH FOR PIVOTAL ELEMENT
DO 105 J=1,N
IF INDEX(J,3)-1) 60,105,60
DO 100 K=1,N
IF INDEX(K,3)-1) 80,100,715
IF (APMAX - DABS(A(J,K))) 85,100,100
IROW=J
ICOLUMN=K
APMAX=DABS(A(J,K))
CONTINUE
INDEX(1,1)=IROW
INDEX(1,2)=ICOLUMN
C-----
-->INTERCHANGE ROWS TO PUT PIVOT ELEMENT ON DIAGONAL
IF (IROW=ICOLUMN) 30,310,140
DETERM=-DETERM
DO 200 I=1,N
SWAP=A(I,IROW,L)
A(I,IROW,L)=A(ICOLUMN,L)
A(ICOLUMN,L)=SWAP
IF (M) 310,310,210
DO 250 L=1,M
SWAP=B(I,IROW,L)
B(I,IROW,L)=B(ICOLUMN,L)
B(ICOLUMN,L)=SWAP
CONTINUE
C-----
-->DIVIDE PIVOT ROW BY PIVOT ELEMENT
PIVOT=A(ICOLUMN,ICOLUMN)
DETERM=DETERM/PIVOT
A(ICOLUMN,ICOLUMN)=1.000
DO 350 L=1,N
A(ICOLUMN,L)=A(ICOLUMN,L)/PIVOT
IF (M) 380,380,360
DO 370 L=1,M
B(ICOLUMN,L)=B(ICOLUMN,L)/PIVOT
CONTINUE
C-----
-->REDUCE NON-PIVOT ROWS
DO 550 LI=1,N
IF (LI=ICOLUMN) 400,550,400
T=A(LI,ICOLUMN)
A(LI,ICOLUMN)=0.000
DO 450 L=1,N
A(LI,L)=A(LI,L)-A(ICOLUMN,L)*T
IF (M) 550,550,450
DO 500 L=1,M
B(LI,L)=B(LI,L)-B(ICOLUMN,L)*T
CONTINUE
CONTINUE
C-----
-->INTERCHANGE COLUMNS
DO 710 I=1,N
L=N+1-I
JROW=INDEX(L,1)
JCOL=INDEX(L,2)
DO 705 K=1,N
SWAP=A(K,JROW)
A(K,JROW)=A(K,JCOL)
A(K,JCOL)=SWAP
CONTINUE
CONTINUE
DO 730 K=1,N
IF (INDEX(K,3)-1) 715,730,715
ID=3
GO TO 740
CONTINUE
ID=1
RETURN
END
C-----CORRECT TRIG-----
SUBROUTINE TRIGANG(S,C)
DOUBLE PRECISION ANG,S,C,UNIT
C-----
C-----

```



DUAL ATGRBS

COVARIANCE

(12x20 FORMULATION)

>SET UIC=E160.1603  
>PIP DK1: LI

DIRECTORY DK1:E160.1603  
22-MAR-78 09:05

LIBR2.FTN;4	7.	17-MAR-78 09:03
LIBR2.OBJ;5	17.	17-MAR-78 09:03
OLD.D.TSK;20	84.	17-MAR-78 09:03
VECTOR.OBJ;10	21.	17-MAR-78 09:03
OLDINPUT.OBJ;3	13.	17-MAR-78 09:03
VECTOR.FTN;52	9.	17-MAR-78 09:03
OLDORIG3.FTN;21	22.	17-MAR-78 09:03
OLD.CUD;1	1.	17-MAR-78 09:03
OLDINPUT.FTN;3	7.	17-MAR-78 09:03
OLDORIG3.OBJ;16	39.	17-MAR-78 09:03
OLDCOLUMN.OBJ;12	14.	17-MAR-78 09:03
OLDCOLUMN.FTN;17	7.	17-MAR-78 09:03

\*TOTAL OF 241. BLOCKS IN 12. FILES

>PIP DK1:Q-U

>PIP TII=DK1:OLDD.CMD  
DK1:OLDD-DK1:OLDDRIVE3,DK1:OLDCOLUMN,DK1:OLDINPUT,DK1:VECTOR,DK1:LIBR2  
LIBR-FORRES:RO  
,,  
,



E-28



E-30



```

558 DO 572 I=1,20
559 IF(I.EQ.1) .NE. 0)GOTO 558
561 $I)=DSORT(P(J,I))
562 J=J+1
563 IF(I.PRINT .EQ. 1)WRITE(5,812)S
564 C
565 DO 559 I=1,20
566 IF(I.EQ.3) .OR. I.EQ.4 .OR. I.EQ.7 .OR. I.EQ.11 .OR.
567 I.EQ.12 .OR. I.EQ.15 .OR. I.EQ.18 .OR. I.EQ.20)GOTO 565
568 T(I)=S(I)*CONUNT
569 GOTO 559
570 T(I)=S(I)*CONUNDR
571 C
572 CONTINUE
573 IF(I.PRINT .EQ. 1)WRITE(5,812)T
574 C
575 ERRMAT(NUMBER,1)=T(17)
576 ERRMAT(NUMBER,2)=T(18)
577 ERRMAT(NUMBER,3)=T(19)
578 ERRMAT(NUMBER,4)=T(20)
579 CEPI=DSORT(S(17))S(17)+RHOO2RHOO2S(18)S(18))
580 CEPI=DSORT(S(19))S(19)+RHOO2RHOO2S(20)S(20))
581 CEPI=CEPI*CONUNT
582 CEPI=CEPI*CONUNT
583 ERRMAT(NUMBER,5)=CEPI
584 ERRMAT(NUMBER,6)=CEPI
585 WRITE(5,792)I,T(17),T(18),T(19),T(20),CEPI,CEPI
586 C
587 NUMBER=NUMBER+1
588 C
589 CONTINUE
590 C
591 NUMBER=NUMBER-2
592 NUMCAN=0
593 C
594 WRITE(5,716)
595 READ(5,791)ICHAN
596 IF(ICHAN .EQ. 2)GOTO 576
597 WRITE(5,712)
598 READ(5,791)NUMCAN
599 C
600 DO 568 II=1,NUMCAN
601 WRITE(5,714)II
602 READ(5,791)IBLANK(II)
603 C
604 CONTINUE
605 J=1
606 IF(1)BLANK(J) .NE. 1)GOTO 567
607 J=J+1
608 IF(J) .GT. NUMCAN)GOTO 569
609 I=1+1
610 GOTO 565
611 DO 571 KY=1,6
612 ERRMAT(I-J+1,KK)=ERRMAT(I,KK)
613 CONTINUE
614 I=I+1
615 GOTO 565
616 C
617 CONTINUE
618 DO 572 II=1+1,NUMBER

```

```

DO 572 KK=1,6
ERRMAT(II-J+1,KK)=ERRMAT(II,KK)
CONTINUE
WRITE(5,716)
READ(5,791)ICHAN
IF(ICHAN .EQ. 2)GOTO 576
DO 563 II=1,NUMBER-NUMCAN
WRITE(5,722)II,(ERRMAT(II,J),J=1,6)
CONTINUE
IF(I.PRINT .EQ. 1)GOTO 581
NUMBER=NUMBER-NUMCAN
DO 578 I=1,6
CALL STAT1(ERRMAT,II,NUMBER,AVER,SDEV)
WRITE(5,744)II,AVER,SDEV
CONTINUE
.....
FORMAT(F10.3)
FORMAT(1H8,' WANT DEBUG PRINTOUTS (V=1/N=2)---')
FORMAT(1H8,' ANY CHANGES (V=1/N=2)---')
FORMAT(1H8,' HOW MANY CHANGES ---')
FORMAT(1H8,' 15, CHANGE ROW ?')
FORMAT(1H8,' 14, SEE ERRMAT (V=1/2=N)---')
FORMAT(' ',14,' ',6F11.3)
FORMAT(' ',NUMBER,AVER,SD ---',110,' ',2F12.4)
FORMAT(' ',INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)')
FORMAT(1H8,' DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) -
FORMAT(3F10.3)
FORMAT(' ',INPUT (COUNT) POSITION RELATIVE TO RADAR (1)')
FORMAT(1H8,' DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) -
FORMAT(1H8,' INPUT (TARGET ONE) POSITION RELATIVE TO (COUNT)')
FORMAT(' ',INPUT (TARGET ONE) POSITION RELATIVE TO (COUNT)')
FORMAT(2F10.4)
FORMAT(' ',VECTOR RHOUI2 ---',3F10.3)
FORMAT(' ',VECTOR RHOUI8 ---',3F10.3)
FORMAT(' ',INPUT (TARGET TWO) POSITION RELATIVE TO (COUNT)')
FORMAT(1H8,' BETA START, STOP INCREMENT (DEG) ---')
FORMAT(314)
FORMAT(1)
FORMAT(14,6E11.3)
FORMAT(' ',BETA RANGE1,2 BEARING1,2 CEPI C
STOP' --END OF BCAS PROGRAM--'
END
SUBROUTINE UNIT(VECTOR,EVEC)
DOUBLE PRECISION VECTOR(3),EVEC(3),DVEC(3)
CALL LATERL(VECTOR,DVEC)
RETURN
END

```



```

>PIP TI:IN:11OLD COLUMN.FTN
+ SUBROUTINE COLUMN(COL,IPRINT,
+ ALF10,ALF20,
+ ALF11,ALF12,ALF21,ALF22,
+ BETAI,BETA2,
+ RHO1T,RHO12,RHO1T,RHO2T,RHO2T2,
+ RHO1T,RHO2T)
C
C DOUBLE PRECISION COL(12,20),ALF10,ALF20
C DOUBLE PRECISION ALF11,ALF12,ALF21,ALF22
C DOUBLE PRECISION BETAI,BETA2
C DOUBLE PRECISION RHO1T,RHO2T,RHO1T,RHO2T2,RHO2T
C DOUBLE PRECISION RHO1T,RHO2T
C DOUBLE PRECISION C1,C2,C3,C4,C5,C6,C7,C8,C9,C10,C11,C12
C DOUBLE PRECISION S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12
C
C IF(IPRINT.NE.1)GOTO 777
C WRITE(S,990)ALF10,ALF20,ALF11,ALF12,ALF21,ALF22
C WRITE(S,990)BETAI,BETA2,RHO1T,RHO2T,RHO1T,RHO2T2,RHO2T
C FORMAT(' ',6F10.4)
C
C DO 510 I=1,12
C DO 510 J=1,20
C COL(I,J)=0.0D0
C CONTINUE
C
C CALL TRIG(ALFD11,S1,C1)
C CALL TRIG(BETAI-ALF10,S2,C2)
C CALL TRIG(BETAI-ALF10,S3,C3)
C CALL TRIG(ALFD12,S4,C4)
C CALL TRIG(ALFD21,S5,C5)
C CALL TRIG(BETAI-ALF20,S6,C6)
C CALL TRIG(BETAI-ALF20,S7,C7)
C CALL TRIG(ALFD22,S8,C8)
C CALL TRIG(ALF10-ALF20,S10,C10)
C CALL TRIG(ALF10-ALF20+ALFD11-ALFD21,S11,C11)
C CALL TRIG(ALF10-ALF20+ALFD12-ALFD22,S12,C12)
C
C C-----COLUMN #1-----
C COL(1,1) = -1.0D0
C COL(2,1) = -1.0D0
C COL(4,1) = -1.0D0
C COL(5,1) = -1.0D0
C
C C-----COLUMN #2-----
C COL(1,2) = 1.0D0
C COL(2,2) = 0
C COL(3,2) = 51
C COL(12,2) = RHO1T-RHO2T2C11
C
C C-----COLUMN #3-----
C COL(2,3) = -RHO2T2S2
C COL(3,3) = -RHO2T2C2
C COL(5,3) = -RHO2T2S3
C COL(6,3) = -RHO2T2C3
C COL(12,3) = RHO1T-RHO2T2S11 - RHO1T2-RHO2T2S12
C
C C-----COLUMN #4-----
C COL(2,4) = -RHO1T2S1
C COL(3,4) = -RHO1T2C1
C COL(12,4) = RHO1T-RHO2T2S11
C
C C-----COLUMN #5-----
C COL(2,5) = -RHO2T2S2
C COL(3,5) = -RHO2T2C2
C COL(5,5) = -RHO2T2S3
C COL(6,5) = -RHO2T2C3
C COL(12,5) = RHO1T-RHO2T2S11 + RHO1T2-RHO2T2S12
C
C C-----COLUMN #6-----
C COL(1,6) = -1.0D0
C COL(4,6) = 1.0D0
C COL(5,6) = 54
C COL(6,6) = 54
C COL(12,6) = -RHO1T2-RHO2T2C12
C
C C-----COLUMN #7-----
C COL(5,7) = -RHO1T2S4
C COL(6,7) = -RHO1T2C4
C COL(12,7) = -RHO1T2-RHO2T2S12
C
C C-----COLUMN #8-----
C COL(4,8) = -1.0D0
C
C C-----COLUMN #9-----
C COL(7,9) = -1.0D0
C COL(8,9) = -1.0D0
C COL(10,9) = -1.0D0
C COL(11,9) = -1.0D0
C
C C-----COLUMN #10-----
C COL(7,10) = 1.0D0
C COL(8,10) = 55
C COL(9,10) = 55
C COL(12,10) = RHO2T-RHO1T2C11
C
C C-----COLUMN #11-----
C COL(8,11) = -RHO2T2S6
C COL(9,11) = -RHO2T2C6
C COL(11,11) = -RHO2T2S7
C COL(12,11) = -RHO1T2-RHO2T2S11 + RHO1T2-RHO2T2S12
C
C C-----COLUMN #12-----
C COL(8,12) = -RHO2T2S5
C COL(9,12) = -RHO2T2C5
C COL(12,12) = -RHO1T2-RHO2T2S11
C
C C-----COLUMN #13-----
C COL(7,13) = -1.0D0
C
C C-----COLUMN #14-----
C COL(10,14) = 1.0D0
C COL(11,14) = 58
C COL(12,14) = -RHO2T2-RHO1T2C12
C
C C-----COLUMN #15-----
C COL(11,15) = -RHO2T2S8
C COL(12,15) = -RHO1T2-RHO2T2S12
C
C C-----COLUMN #16-----
C COL(10,16) = -1.0D0
C
C C-----COLUMN #17-----
C COL(1,17) = 1.0D0
C COL(2,17) = -52
C COL(3,17) = -52
C COL(7,17) = 1.0D0
C COL(8,17) = -56
C COL(9,17) = -56
C
C C-----COLUMN #18-----
C COL(2,18) = -RHO2T2S2

```



```

COL(3,18) : -COL(3,3)
COL(8,18) : -COL(8,11)
COL(9,18) : -COL(9,11)

C.....COLUMN 19.....
COL(4,19) : 1.000
COL(5,19) : -C3
COL(6,19) : -53
COL(10,19) : 1.000
COL(11,19) : -C7
COL(12,19) : -57

C.....COLUMN 20.....
COL(5,20) : -COL(5,3)
COL(6,20) : -COL(6,3)
COL(11,20) : -COL(11,11)
COL(12,20) : -COL(12,11)

C
RETURN
END
>

```



E-34



```

169 FORMAT(1H6, ' SIGMA DTOA21 (FT) -->')
170 FORMAT(1H6, ' SIGMA RHO212 (FT) -->')
171 FORMAT(1H6, ' SIGMA ALP222 (DEG) -->')
172 FORMAT(1H6, ' SIGMA DTOA22 (FT) -->')
173 FORMAT(1H6, ' SIGMA RHO211 (FT) -->')
174 FORMAT(1H6, ' SIGMA RHO211 (DEG) -->')
175 FORMAT(1H6, ' SIGMA BETA1 (DEG) -->')
176 FORMAT(1H6, ' SIGMA RHO212 (FT) -->')
177 FORMAT(1H6, ' SIGMA BETA2 (DEG) -->')
END
>

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DATA FOR  
BCAS MODES  
USED  
IN  
THE  
RECOMMENDED CONCEPT

ATTACHMENT II



# SUMMARY CHART

<u>Mode</u>	<u>Range BCAS/Target</u>	<u>Comments</u>
Single #7	10/5 20/8 50/10 100/20	ATCRBS
Single #9	10/5 20/8 50/10 100/20	Semi-active ATCRBS and DABS
Single #15	10/5 20/8 50/10 100/20	Semi-active ATCRBS
Single #15	10/5 20/8 50/10 100/20	Semi-active ATCRBS with Directional Antenna with 1° Error
Single #20	10/5 20/8 50/10 100/20	Semi-active ATCRBS and DABS
Dual #13	10/5 20/8 50/10 100/20	Semi-active ATCRBS Passive
Dual #20	10/5 20/8 50/10 100/20	Passive
Dual #26	10/5 20/8 50/10 100/20	Semi-active



# SUMMARY CHART (CONTINUED)

<u>Mode</u>	<u>Range BCAS/Target</u>	<u>Comments</u>
Dual #26	10/5 20/8 50/10 100/20	Passive with Directional Antenna with 1° Error
Dual #26	10/5 20/8 50/10 100/20	Semi-active with Directional Antenna with 1° Error
Dual #32	10/5 20/8 50/10 100/20	Transfer Algorithm



```

--UN DIVISION
--ENTER NUMBER OF MEASUREMENTS -->4
--CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO12
3..ALF10
4..ALF12
5..TAN10
6..TAN12
7..BETA

ENTER NUMBERS -->1,3,4,5

1
3
4
5
SIGMA RHO10 (FT) -->100.
SIGMA ALF10 (DEG) -->1.768
SIGMA ALF12 (DEG) -->1.25
SIGMA DTOR1 (FT) -->100.
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE(NM), BEARING(DEG) AND HEIGHT(FT) -->10.
VECTOR RHO12 -->10.000 0.000 0.000

INPUT (OWN) POSITION RELATIVE TO RADAR (1)
DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) -->10.60.
VECTOR RHO10 -->5.000 8.660 0.000

INPUT (TARGET) POSITION RELATIVE TO (OWN)
DISTANCE(NM) AND ALTITUDE(FT) -->5.
BETA START, INCREMENT (DEG) -->5.5

BETA RANGE BEARING CEP
0 138.4316 0.6907 391.5207
5 129.4289 0.7030 394.5698
10 120.3002 0.7143 397.4131
15 111.0979 0.7248 400.0315
20 101.8312 0.7342 402.4092
25 92.7716 0.7426 404.5331
30 83.8631 0.7499 406.3028
35 75.3368 0.7562 407.9796
40 67.4319 0.7613 409.2866
45 60.4808 0.7654 410.3085
50 54.9245 0.7682 411.0412
55 51.2785 0.7700 411.4819
60 50.0000 0.7706 411.6290
65 51.2785 0.7700 411.4819
70 54.9245 0.7682 411.0412
75 60.4808 0.7654 410.3085
80 67.4312 0.7613 409.2866
85 75.3368 0.7562 407.9796
90 83.8631 0.7499 406.3028
95 92.7716 0.7426 404.5331
100 101.8312 0.7342 402.4092
105 111.0979 0.7248 400.0315
110 120.3002 0.7143 397.4131
115 129.4289 0.7030 394.5698
120 138.4316 0.6907 391.5207
125 147.5698 0.6776 388.2893
130 156.9120 0.6637 384.9041
135 165.3425 0.6491 381.4004
140 172.5520 0.6339 377.8219
145 179.4316 0.6182 374.2229
150 185.9574 0.6021 370.6723
155 192.0959 0.5858 367.2581
160 197.8574 0.5694 364.0940
165 203.2596 0.5532 361.2099
170 208.2992 0.5375 358.7668
175 212.9992 0.5226 357.8801
180 217.3596 0.5090 357.8568
185 221.3823 0.4943 357.6667
190 225.0675 0.4836 357.3501
195 228.5050 0.4751 356.9266
200 231.6950 0.4685 356.4026
205 234.6375 0.4637 355.8801
210 237.4325 0.4597 355.3596
215 240.0800 0.4564 354.8426
220 242.5800 0.4536 354.3326
225 244.9325 0.4511 353.8293
230 247.1475 0.4488 353.3326
235 249.2250 0.4467 352.8426
240 251.1650 0.4447 352.3596
245 253.0675 0.4428 351.8801
250 254.9325 0.4411 351.4026
255 256.7500 0.4394 350.9266
260 258.5125 0.4379 350.4526
265 260.2200 0.4364 349.9801
270 261.8725 0.4350 349.5096
275 263.4700 0.4337 349.0400
280 265.0125 0.4324 348.5723
285 266.5000 0.4312 348.1075
290 267.9325 0.4300 347.6450
295 269.3100 0.4289 347.1850
300 270.6325 0.4278 346.7275
305 271.9000 0.4267 346.2725
310 273.1125 0.4257 345.8200
315 274.2700 0.4247 345.3696
320 275.3725 0.4237 344.9211
325 276.4200 0.4228 344.4746
330 277.4125 0.4218 344.0306
335 278.3500 0.4209 343.5891
340 279.2325 0.4200 343.1496
345 280.0600 0.4191 342.7121
350 280.8325 0.4183 342.2776
355 281.5500 0.4174 341.8451
360 282.2125 0.4166 341.4146
365 282.8200 0.4158 340.9861
370 283.3725 0.4150 340.5596
375 283.8700 0.4142 340.1351
380 284.3125 0.4134 339.7126
385 284.7000 0.4126 339.2921
390 285.0325 0.4118 338.8736
395 285.3100 0.4110 338.4571
400 285.5325 0.4102 338.0426
405 285.7000 0.4094 337.6301
410 285.8125 0.4086 337.2196
415 285.8700 0.4078 336.8111
420 285.8825 0.4070 336.4046
425 285.8500 0.4062 336.0001
430 285.7725 0.4054 335.5976
435 285.6500 0.4046 335.1971
440 285.4825 0.4038 334.7986
445 285.2700 0.4030 334.4021
450 285.0125 0.4022 334.0076
455 284.7100 0.4014 333.6151
460 284.3625 0.4006 333.2246
465 283.9700 0.3998 332.8361
470 283.5325 0.3990 332.4496
475 283.0500 0.3982 332.0651
480 282.5225 0.3974 331.6826
485 281.9500 0.3966 331.2921
490 281.3325 0.3958 330.9036
495 280.6700 0.3950 330.5171
500 280.0625 0.3942 330.1326
505 279.4100 0.3934 329.7496
510 278.7125 0.3926 329.3681
515 277.9700 0.3918 328.9886
520 277.1825 0.3910 328.6011
525 276.3500 0.3902 328.2156
530 275.4725 0.3894 327.8321
535 274.5500 0.3886 327.4506
540 273.5825 0.3878 327.0711
545 272.5700 0.3870 326.6936
550 271.5125 0.3862 326.3181
555 270.4100 0.3854 325.9446
560 269.2625 0.3846 325.5731
565 268.0700 0.3838 325.2036
570 266.8325 0.3830 324.8361
575 265.5500 0.3822 324.4716
580 264.2225 0.3814 324.1096
585 262.8500 0.3806 323.7501
590 261.4325 0.3798 323.3936
595 260.0700 0.3790 323.0401
600 258.6625 0.3782 322.6896
605 257.2100 0.3774 322.3421
610 255.7125 0.3766 321.9976
615 254.1700 0.3758 321.6561
620 252.5825 0.3750 321.3176
625 250.9500 0.3742 320.9821
630 249.2725 0.3734 320.6496
635 247.5500 0.3726 320.3196
640 245.7825 0.3718 320.0031
645 243.9700 0.3710 319.6896
650 242.1125 0.3702 319.3796
655 240.2100 0.3694 319.0731
660 238.2625 0.3686 318.7696
665 236.2700 0.3678 318.4696
670 234.2325 0.3670 318.1731
675 232.1500 0.3662 317.8796
680 230.0225 0.3654 317.5896
685 227.8500 0.3646 317.2936
690 225.6325 0.3638 316.9916
695 223.3700 0.3630 316.6936
700 221.0625 0.3622 316.3996
705 218.7100 0.3614 316.1096
710 216.3125 0.3606 315.8236
715 213.8700 0.3598 315.5416
720 211.3825 0.3590 315.2636
725 208.8500 0.3582 314.9896
730 206.2725 0.3574 314.7196
735 203.6500 0.3566 314.4536
740 201.0825 0.3558 314.1916
745 198.4700 0.3550 313.9336
750 195.8125 0.3542 313.6796
755 193.1100 0.3534 313.4296
760 190.3625 0.3526 313.1836
765 187.5700 0.3518 312.9416
770 184.7325 0.3510 312.7036
775 181.8500 0.3502 312.4696
780 178.9225 0.3494 312.2396
785 175.9500 0.3486 312.0136
790 172.9325 0.3478 311.7916
795 169.8700 0.3470 311.5736
800 166.7625 0.3462 311.3596
805 163.6100 0.3454 311.1496
810 160.4125 0.3446 310.9436
815 157.1700 0.3438 310.7416
820 153.8825 0.3430 310.5436
825 150.5500 0.3422 310.3496
830 147.1725 0.3414 310.1596
835 143.7500 0.3406 310.0036
840 140.2825 0.3398 309.8516
845 136.7700 0.3390 309.7036
850 133.2125 0.3382 309.5596
855 129.6100 0.3374 309.4196
860 125.9625 0.3366 309.2836
865 122.2700 0.3358 309.1516
870 118.5325 0.3350 309.0236
875 114.7500 0.3342 308.8996
880 110.9225 0.3334 308.7796
885 107.0500 0.3326 308.6636
890 103.1325 0.3318 308.5516
895 99.1700 0.3310 308.4436
900 95.1625 0.3302 308.3396
905 91.1100 0.3294 308.2396
910 87.0125 0.3286 308.1436
915 82.8700 0.3278 308.0516
920 78.6825 0.3270 307.9636
925 74.4500 0.3262 307.8796
930 70.1725 0.3254 307.7996
935 65.8500 0.3246 307.7236
940 61.4825 0.3238 307.6516
945 57.0700 0.3230 307.5836
950 52.6125 0.3222 307.5196
955 48.1100 0.3214 307.4596
960 43.5625 0.3206 307.4036
965 38.9700 0.3198 307.3516
970 34.3325 0.3190 307.3036
975 29.6500 0.3182 307.2596
980 24.9225 0.3174 307.2196
985 20.1500 0.3166 307.1836
990 15.3325 0.3158 307.1516
995 10.4700 0.3150 307.1236
1000 5.5625 0.3142 307.0996

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1. IN LISTING
2. ENTER NUMBER OF MEASUREMENTS -->4
3. ENTER THE FOLLOWING MEASUREMENTS BY NUMBER:
4. 1. RHO10
5. 2. RHO11
6. 3. ALF10
7. 4. ALF11
8. 5. TH01
9. 6. TH02
10. 7. BETA

ENTER NUMBERS -->1,3,4,5
1
3
4
5
SIGMA RHO10 (FT) -->100.
SIGMA ALF10 (DEG) -->1.768
SIGMA TH01 (DEG) -->25.
SIGMA TH02 (DEG) -->100.
INPUT RHO10 (2) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM) BEARING (DEG) AND HEIGHT (FT) -->20.
VECTOR RHO12 --> 20.000 0.000 0.000

INPUT (NM) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->20.60.
VECTOR RHO10 --> 10.000 17.321 0.000

INPUT (TARGET) POSITION RELATIVE TO (NM)
DISTANCE (NM) AND ALTITUDE (FT) -->28.
BETA START, INCREMENT (DEG) -->0.5

BETA RANGE BEARING CEP
0 270.4585 0.8024 732.5005
5 250.0889 0.8163 736.2023
10 229.4935 0.8201 739.9138
15 208.6704 0.8209 743.3139
20 187.6979 0.8516 746.4505
25 166.6395 0.8611 749.2886
30 145.6970 0.8694 751.7996
35 124.7758 0.8764 753.9603
40 104.4402 0.8823 755.7519
45 85.1391 0.8868 757.1599
50 67.9464 0.8901 758.1732
55 55.0464 0.8920 758.7842
60 50.0000 0.8927 758.9884
65 55.0464 0.8920 758.7842
70 67.9464 0.8901 757.1732
75 85.1391 0.8868 755.7519
80 104.4402 0.8823 753.9603
85 124.7758 0.8764 751.7996
90 145.6970 0.8694 749.2886
95 166.6395 0.8611 746.4505
100 187.6979 0.8516 743.3139
105 208.6704 0.8209 739.9138
110 229.4935 0.8201 736.2023
115 250.0889 0.8163 732.5005
120 270.4585 0.8024 728.6003
125 290.5818 0.7718 724.6671
130 310.4663 0.7552 720.7927
135 330.1391 0.7424 717.0900
140 349.6504 0.7380 713.6986
145 369.0783 0.7360 710.5929
150 388.5370 0.7352 707.5929
155 407.1044 0.7352 704.6929
160 425.8278 0.7352 701.7929
165 444.6317 0.7352 700.4769
170 463.5318 0.7352 700.4769
175 482.5318 0.7352 700.4769
180 501.5318 0.7352 700.4769
185 520.5318 0.7352 700.4769
190 539.5318 0.7352 700.4769
195 558.5318 0.7352 700.4769
200 577.5318 0.7352 700.4769
205 596.5318 0.7352 700.4769
210 615.5318 0.7352 700.4769
215 634.5318 0.7352 700.4769
220 653.5318 0.7352 700.4769
225 672.5318 0.7352 700.4769
230 691.5318 0.7352 700.4769
235 710.5318 0.7352 700.4769
240 729.5318 0.7352 700.4769
245 748.5318 0.7352 700.4769
250 767.5318 0.7352 700.4769
255 786.5318 0.7352 700.4769
260 805.5318 0.7352 700.4769
265 824.5318 0.7352 700.4769
270 843.5318 0.7352 700.4769
275 862.5318 0.7352 700.4769
280 881.5318 0.7352 700.4769
285 900.5318 0.7352 700.4769
290 919.5318 0.7352 700.4769
295 938.5318 0.7352 700.4769
300 957.5318 0.7352 700.4769
305 976.5318 0.7352 700.4769
310 995.5318 0.7352 700.4769
315 1014.5318 0.7352 700.4769
320 1033.5318 0.7352 700.4769
325 1052.5318 0.7352 700.4769
330 1071.5318 0.7352 700.4769
335 1090.5318 0.7352 700.4769
340 1109.5318 0.7352 700.4769
345 1128.5318 0.7352 700.4769
350 1147.5318 0.7352 700.4769
355 1166.5318 0.7352 700.4769
360 1185.5318 0.7352 700.4769
365 1204.5318 0.7352 700.4769
370 1223.5318 0.7352 700.4769
375 1242.5318 0.7352 700.4769
380 1261.5318 0.7352 700.4769
385 1280.5318 0.7352 700.4769
390 1299.5318 0.7352 700.4769
395 1318.5318 0.7352 700.4769
400 1337.5318 0.7352 700.4769
405 1356.5318 0.7352 700.4769
410 1375.5318 0.7352 700.4769
415 1394.5318 0.7352 700.4769
420 1413.5318 0.7352 700.4769
425 1432.5318 0.7352 700.4769
430 1451.5318 0.7352 700.4769
435 1470.5318 0.7352 700.4769
440 1489.5318 0.7352 700.4769
445 1508.5318 0.7352 700.4769
450 1527.5318 0.7352 700.4769
455 1546.5318 0.7352 700.4769
460 1565.5318 0.7352 700.4769
465 1584.5318 0.7352 700.4769
470 1603.5318 0.7352 700.4769
475 1622.5318 0.7352 700.4769
480 1641.5318 0.7352 700.4769
485 1660.5318 0.7352 700.4769
490 1679.5318 0.7352 700.4769
495 1698.5318 0.7352 700.4769
500 1717.5318 0.7352 700.4769
505 1736.5318 0.7352 700.4769
510 1755.5318 0.7352 700.4769
515 1774.5318 0.7352 700.4769
520 1793.5318 0.7352 700.4769
525 1812.5318 0.7352 700.4769
530 1831.5318 0.7352 700.4769
535 1850.5318 0.7352 700.4769
540 1869.5318 0.7352 700.4769
545 1888.5318 0.7352 700.4769
550 1907.5318 0.7352 700.4769
555 1926.5318 0.7352 700.4769
560 1945.5318 0.7352 700.4769
565 1964.5318 0.7352 700.4769
570 1983.5318 0.7352 700.4769
575 2002.5318 0.7352 700.4769
580 2021.5318 0.7352 700.4769
585 2040.5318 0.7352 700.4769
590 2059.5318 0.7352 700.4769
595 2078.5318 0.7352 700.4769
600 2097.5318 0.7352 700.4769
605 2116.5318 0.7352 700.4769
610 2135.5318 0.7352 700.4769
615 2154.5318 0.7352 700.4769
620 2173.5318 0.7352 700.4769
625 2192.5318 0.7352 700.4769
630 2211.5318 0.7352 700.4769
635 2230.5318 0.7352 700.4769
640 2249.5318 0.7352 700.4769
645 2268.5318 0.7352 700.4769
650 2287.5318 0.7352 700.4769
655 2306.5318 0.7352 700.4769
660 2325.5318 0.7352 700.4769
665 2344.5318 0.7352 700.4769
670 2363.5318 0.7352 700.4769
675 2382.5318 0.7352 700.4769
680 2401.5318 0.7352 700.4769
685 2420.5318 0.7352 700.4769
690 2439.5318 0.7352 700.4769
695 2458.5318 0.7352 700.4769
700 2477.5318 0.7352 700.4769
705 2496.5318 0.7352 700.4769
710 2515.5318 0.7352 700.4769
715 2534.5318 0.7352 700.4769
720 2553.5318 0.7352 700.4769
725 2572.5318 0.7352 700.4769
730 2591.5318 0.7352 700.4769
735 2610.5318 0.7352 700.4769
740 2629.5318 0.7352 700.4769
745 2648.5318 0.7352 700.4769
750 2667.5318 0.7352 700.4769
755 2686.5318 0.7352 700.4769
760 2705.5318 0.7352 700.4769
765 2724.5318 0.7352 700.4769
770 2743.5318 0.7352 700.4769
775 2762.5318 0.7352 700.4769
780 2781.5318 0.7352 700.4769
785 2800.5318 0.7352 700.4769
790 2819.5318 0.7352 700.4769
795 2838.5318 0.7352 700.4769
800 2857.5318 0.7352 700.4769
805 2876.5318 0.7352 700.4769
810 2895.5318 0.7352 700.4769
815 2914.5318 0.7352 700.4769
820 2933.5318 0.7352 700.4769
825 2952.5318 0.7352 700.4769
830 2971.5318 0.7352 700.4769
835 2990.5318 0.7352 700.4769
840 3009.5318 0.7352 700.4769
845 3028.5318 0.7352 700.4769
850 3047.5318 0.7352 700.4769
855 3066.5318 0.7352 700.4769
860 3085.5318 0.7352 700.4769
865 3104.5318 0.7352 700.4769
870 3123.5318 0.7352 700.4769
875 3142.5318 0.7352 700.4769
880 3161.5318 0.7352 700.4769
885 3180.5318 0.7352 700.4769
890 3199.5318 0.7352 700.4769
895 3218.5318 0.7352 700.4769
900 3237.5318 0.7352 700.4769
905 3256.5318 0.7352 700.4769
910 3275.5318 0.7352 700.4769
915 3294.5318 0.7352 700.4769
920 3313.5318 0.7352 700.4769
925 3332.5318 0.7352 700.4769
930 3351.5318 0.7352 700.4769
935 3370.5318 0.7352 700.4769
940 3389.5318 0.7352 700.4769
945 3408.5318 0.7352 700.4769
950 3427.5318 0.7352 700.4769
955 3446.5318 0.7352 700.4769
960 3465.5318 0.7352 700.4769
965 3484.5318 0.7352 700.4769
970 3503.5318 0.7352 700.4769
975 3522.5318 0.7352 700.4769
980 3541.5318 0.7352 700.4769
985 3560.5318 0.7352 700.4769
990 3579.5318 0.7352 700.4769
995 3598.5318 0.7352 700.4769
1000 3617.5318 0.7352 700.4769
1005 3636.5318 0.7352 700.4769
1010 3655.5318 0.7352 700.4769
1015 3674.5318 0.7352 700.4769
1020 3693.5318 0.7352 700.4769
1025 3712.5318 0.7352 700.4769
1030 3731.5318 0.7352 700.4769
1035 3750.5318 0.7352 700.4769
1040 3769.5318 0.7352 700.4769
1045 3788.5318 0.7352 700.4769
1050 3807.5318 0.7352 700.4769
1055 3826.5318 0.7352 700.4769
1060 3845.5318 0.7352 700.4769
1065 3864.5318 0.7352 700.4769
1070 3883.5318 0.7352 700.4769
1075 3902.5318 0.7352 700.4769
1080 3921.5318 0.7352 700.4769
1085 3940.5318 0.7352 700.4769
1090 3959.5318 0.7352 700.4769
1095 3978.5318 0.7352 700.4769
1100 3997.5318 0.7352 700.4769
1105 4016.5318 0.7352 700.4769
1110 4035.5318 0.7352 700.4769
1115 4054.5318 0.7352 700.4769
1120 4073.5318 0.7352 700.4769
1125 4092.5318 0.7352 700.4769
1130 4111.5318 0.7352 700.4769
1135 4130.5318 0.7352 700.4769
1140 4149.5318 0.7352 700.4769
1145 4168.5318 0.7352 700.4769
1150 4187.5318 0.7352 700.4769
1155 4206.5318 0.7352 700.4769
1160 4225.5318 0.7352 700.4769
1165 4244.5318 0.7352 700.4769
1170 4263.5318 0.7352 700.4769
1175 4282.5318 0.7352 700.4769
1180 4301.5318 0.7352 700.4769
1185 4320.5318 0.7352 700.4769
1190 4339.5318 0.7352 700.4769
1195 4358.5318 0.7352 700.4769
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1965 7284.5318 0.7352 700.4769
1970 7303.5318 0.7352 700.4769
1975
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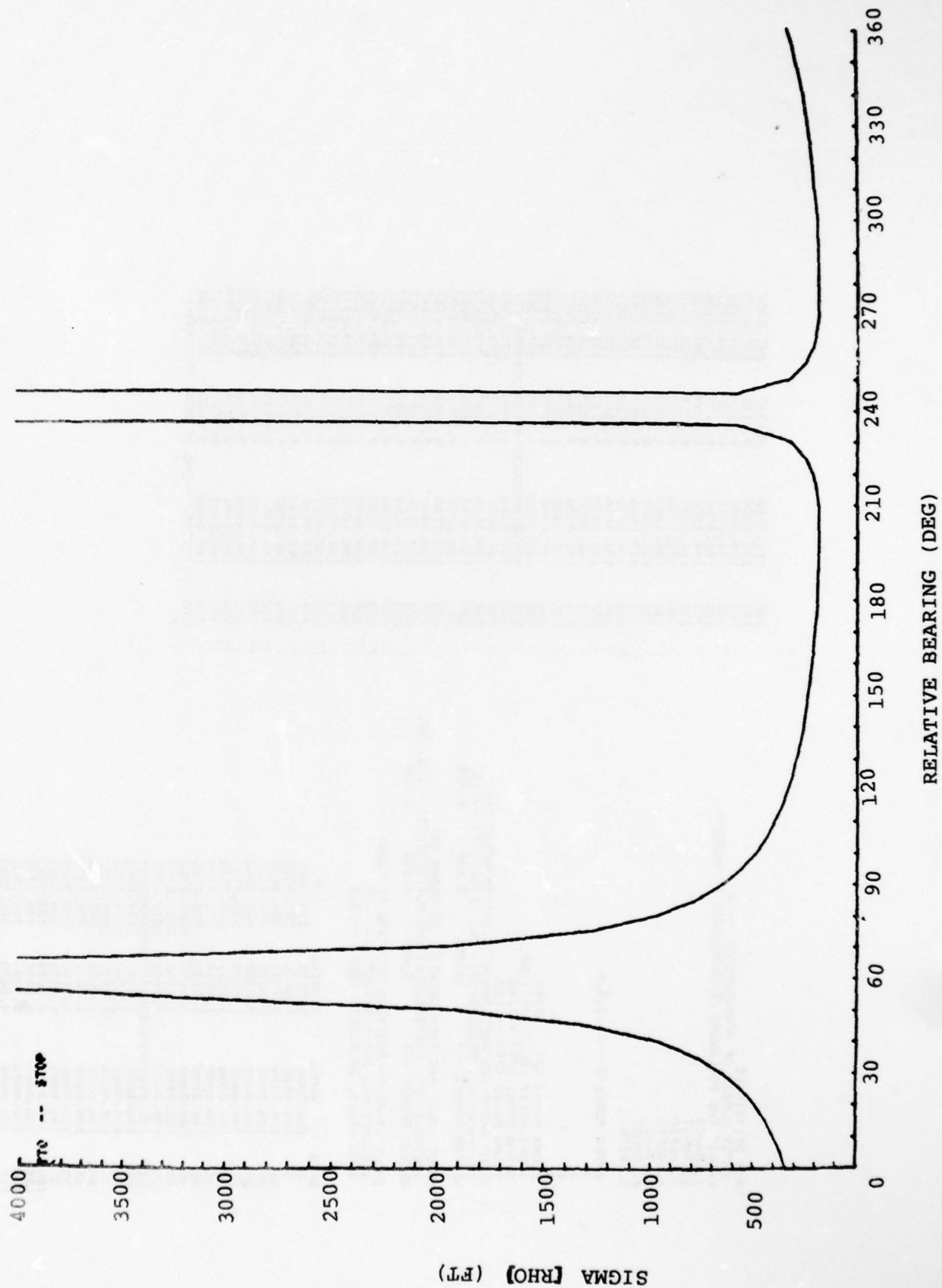
*RTN INITIATING*
ENTER NUMBER OF MEASUREMENTS -->4
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO11
3..RHO12
4..ALF10
5..ALF11
6..THU1
7..BETH
ENTER NUMBERS -->1,3,4,5
1
3
4
5
SIGMA RHO10 (FT) -->100.
SIGMA ALF10 (DEG) -->1768
SIGMA ALF11 (DEG) -->125
SIGMA THU1 (FT) -->100.
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) -->50.
VECTOR RHO12 --> 50.000 0.000 0.000
INPUT (2) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->50.60.
VECTOR RHO10 --> 25.000 43.301 0.000
INPUT (TARGET) POSITION RELATIVE TO (2)
DISTANCE (NM) AND ALTITUDE (FT) -->10.
BETH START, INCREMENT (DEG) -->0.5
BETH
0 705.9955 1647.7389 CEP
1 1.4039 1638.3207
2 1.4301 1630.5125
3 1.4351 1624.0663
4 1.4489 1618.7703
5 1.4615 1614.4523
6 1.4727 1610.9692
7 1.4826 1608.2039
8 1.4910 1606.0621
9 1.4979 1604.4697
10 1.5034 1603.3710
11 1.5096 1602.7270
12 1.5104 1602.5149
13 1.5096 1602.7270
14 1.5073 1603.3710
15 1.5034 1604.4697
16 1.4979 1606.0621
17 1.4910 1608.2039
18 1.4826 1610.9692
19 1.4727 1614.4523
20 1.4615 1618.7703
21 1.4489 1624.0663
22 1.4351 1630.5125
23 1.4301 1638.3207
24 1.4039 1647.7389
25 705.9955 1647.7389
26 1.4039 1638.3207
27 1.4301 1630.5125
28 1.4351 1624.0663
29 1.4489 1618.7703
30 1.4615 1614.4523
31 1.4727 1610.9692
32 1.4826 1608.2039
33 1.4910 1606.0621
34 1.4979 1604.4697
35 1.5034 1603.3710
36 1.5096 1602.7270
37 1.5104 1602.5149
38 1.5096 1602.7270
39 1.5073 1603.3710
40 1.5034 1604.4697
41 1.4979 1606.0621
42 1.4910 1608.2039
43 1.4826 1610.9692
44 1.4727 1614.4523
45 1.4615 1618.7703
46 1.4489 1624.0663
47 1.4351 1630.5125
48 1.4301 1638.3207
49 1.4039 1647.7389
50 705.9955 1647.7389
51 1.4039 1638.3207
52 1.4301 1630.5125
53 1.4351 1624.0663
54 1.4489 1618.7703
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56 1.4727 1610.9692
57 1.4826 1608.2039
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62 1.5104 1602.5149
63 1.5096 1602.7270
64 1.5073 1603.3710
65 1.5034 1604.4697
66 1.4979 1606.0621
67 1.4910 1608.2039
68 1.4826 1610.9692
69 1.4727 1614.4523
70 1.4615 1618.7703
71 1.4489 1624.0663
72 1.4351 1630.5125
73 1.4301 1638.3207
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76 1.4039 1638.3207
77 1.4301 1630.5125
78 1.4351 1624.0663
79 1.4489 1618.7703
80 1.4615 1614.4523
81 1.4727 1610.9692
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87 1.5104 1602.5149
88 1.5096 1602.7270
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97 1.4351 1630.5125
98 1.4301 1638.3207
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124 1.4039 1647.7389
125 705.9955 1647.7389
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422 1.4351 1630.5125
423 1.4301 1638.3207
424 1.4039 1647.7389
425 705.9955 1647.7389
426 1.4039 1638.3207
427 1.4301 1630.5125
428 1.4351 1624.0663
429 1.4489 1618.7703
430 1.4615 1614.4523
431 1.4727 1610.9692
432 1.4826 1608.2039
433 1.4910 1606.0621
434 1.4979 1604.4697
435 1.5034 1603.3710
436 1.5096 1602.7270
437 1.5104 1602.5149
438 1.5096 1602.7270
439 1.5073 1603.3710
440 1.5034 1604.4697
441 1.4979 1606.0621
442 1.4910 1608.2039
443 1.4826 1610.9692
444 1.4727 1614.4523
445 1.4615 1618.7703
446 1.4489 1624.0663
447 1.4351 1630.5125
448 1.4301 1638.3207
449 1.4039 1647.7389
450 705.9955 1647.7389
451 1.4039 1638.3207
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453 1.4351 1624.0663
454 1.4489 1618.7703
455 1.4615 1614.4523
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457 1.4826 1608.2039
458 1.4910 1606.0621
459 1.4979 1604.4697
460 1.5034 1603.3710
461 1.5096 1602.7270
462 1.5104 1602.5149
463 1.5096 1602.7270
464 1.5073 1603.3710
465 1.5034 1604.4697
466 1.4979 1606.0621
467 1.4910 1608.2039
468 1.4826 1610.9692
469 1.4727 1614.4523
470 1.4615 1618.7703
471 1.4489 1624.0663
472 1.4351 1630.5125
473 1.4301 1638.3207
474 1.4039 1647.7389
475 705.9955 1647.7389
476 1.4039 1638.3207
477 1.4301 1630.5125
478 1.4351 1624.0663
479 1.4489 1618.7703
480 1.4615 1614.4523
481 1.4727 1610.9692
482 1.4826 1608.2039
483 1.4910 1606.0621
484 1.4979 1604.4697
485 1.5034 1603.3710
486 1.5096 1602.7270
487 1.5104 1602.5149
488 1.5096 1602.7270
489 1.5073 1603.3710
490 1.5034 1604.4697
491 1.4979 1606.0621
492 1.4910 1608.2039
493 1.4826 1610.9692
494 1.4727 1614.4523
495 1.4615 1618.7703
496 1.4489 1624.0663
497 1.4351 1630.5125
498 1.4301 1638.3207
499 1.4039 1647.7389
500 705.9955 1647.7389
501 1.4039 1638.3207
502 1.4301 1630.5125
503 1.4351 1624.0663
504 1.4489 1618.7703
505 1.4615 1614.4523
506 1.4727 1610.9692
507 1.4826 1608.2039
508 1.4910 1606.0621
509 1.4979 1604.4697
510 1.5034 1603.3710
511 1.5096 1602.7270
512 1.5104 1602.5149
513 1.5096 1602.7270
514 1.5073 1603.3710
515 1.5034 1604.4697
516 1.4979 1606.0621
517 1.4910 1608.2039
518 1.4826 1610.9692
519 1.4727 1614.4523
520 1.4615 1618.7703
521 1.4489 1624.0663
522 1.4351 1630.5125
523 1.4301 1638.3207
524 1.4039 1647.7389
525 705.9955 1647.7389
526 1.4039 1638.3207
527 1.4301 1630.5125
528 1.4351 1624.0663
529 1.4489 1618.7703
530 1.4615 1614.4523
531 1.4727 1610.9692
532 1.4826 1608.2039
533 1.4910 1606.0621
534 1.4979 1604.4697
535 1.5034 1603.3710
536 1.5096 1602.7270
537 1.5104 1602.5149
538 1.5096 1602.7270
539 1.5073 1603.3710
540 1.5034 1604.4697
541 1.4979 1606.0621
542 1.4910 1608.2039
543 1.4826 1610.9692
544 1.4727 1614.4523
545 1.4615 1618.7703
546 1.4489 1624.0663
547 1.4351 1630.5125
548 1.4301 1638.3207
549 1.4039 1647.7389
550 705.9955 1647.7389
551 1.4039 1638.3207
552 1.4301 1630.5125
553 1.4351 1624.0663
554 1.4489 1618.7703
555 1.4615 1614.4523
556 1.4727 1610.9692
557 1.4826 1608.2039
558 1.4910 1606.0621
559 1.4979 1604.4697
560 1.5034 1603.3710
561 1.5096 1602.7270
562 1.5104 1602.5149
563 1.5096 1602.7270
564 1.5073 1603.3710
565 1.5034 1604.4697
566 1.4979 1606.0621
567 1.4910 1608.2039
568 1.4826 1610.9692
569 1.4727 1614.4523
570 1.4615 1618.7703
571 1.4489 1624.0663
572 1.4351 1630.5125
573 1.4301 1638.3
```



```
-- STOP --END OF PROGRAM--
```



Semi-Act  
SINGLE #9  
10,5 equivalent  
ATCRBS





```

*MAIN INSTRUCTIONS
*ENTER NUMBER OF MEASUREMENTS -->4
*CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1...RHO10
2...RHO12
3...ALF10
4...ALF12
5...TAN10
6...TAN12
7...BETA

ENTER NUMBERS -->1,3,5,6
1
3
5
6
SIGMA RHO10 (FT) -->100.
SIGMA ALF10 (DEG) -->1.768
SIGMA DTOM1 (FT) -->100.
SIGMA RHO12 (FT) -->100.
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE(NM), BEARING(DEG) AND HEIGHT(FT) -->10.
VECTOR RHO12 --> 10.000 0.000 0.000

INPUT (NM) POSITION RELATIVE TO RADAR (1)
DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) -->10.60.
VECTOR RHO10 --> 5.000 8.660 0.000

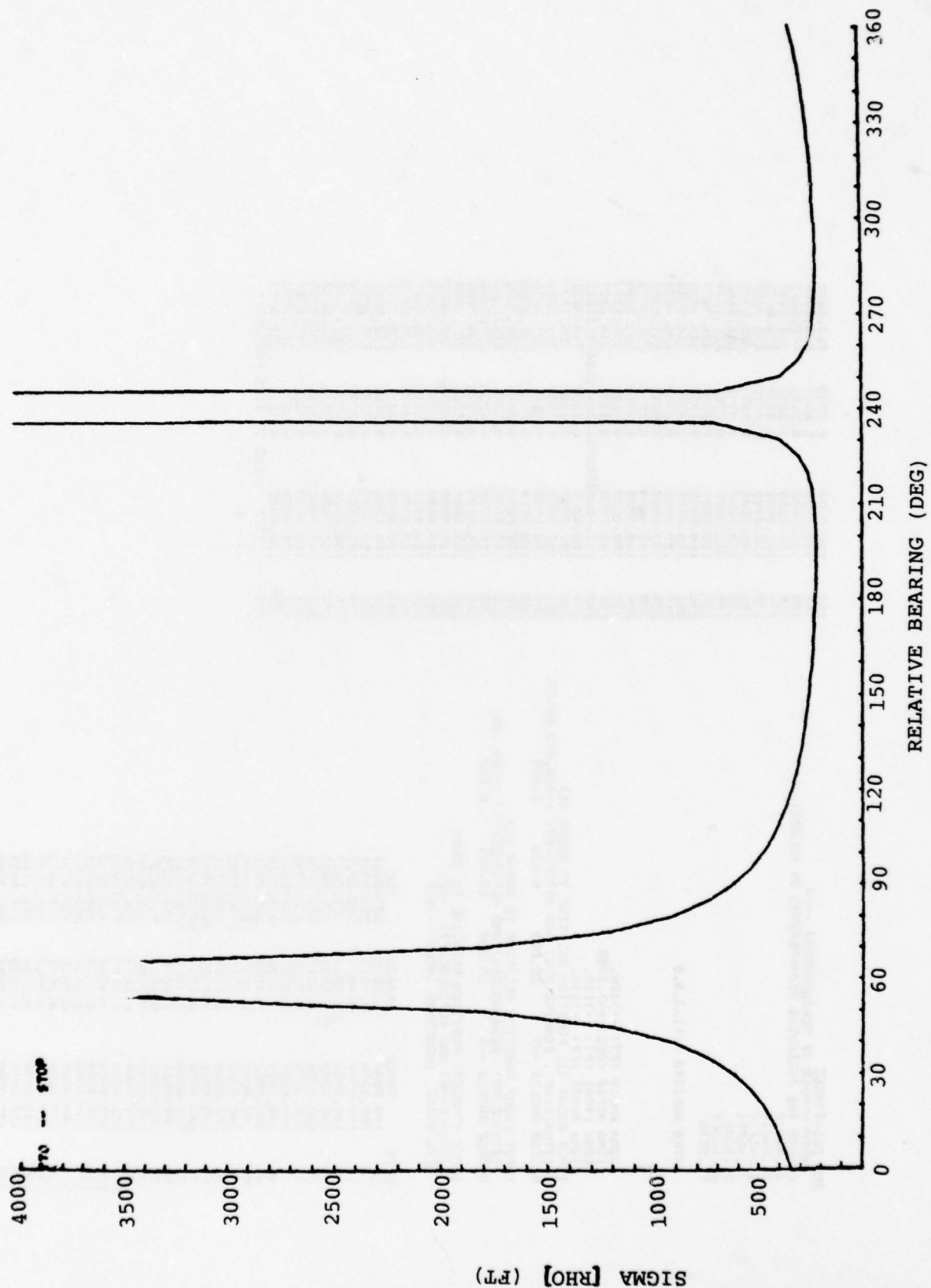
INPUT (TARGET) POSITION RELATIVE TO (NM)
DISTANCE(NM) AND ALTITUDE(FT) -->5.
BETA START, INCREMENT (DEG) -->0.5

BETA RANGE BEARING CEP
0 100.0000 0.6086 337.8401
5 100.0000 0.6630 365.4992
10 100.0000 0.7284 398.9832
15 100.0000 0.8085 440.2319
20 100.0000 0.9088 492.1563
25 100.0000 1.0379 559.3314
30 100.0000 1.2101 649.3828
35 100.0000 1.4514 776.0374
40 100.0000 1.8134 956.7489
45 100.0000 2.3172 1285.5761
50 100.0000 3.0249 1924.6953
55 100.0000 4.0249 2844.9862
60 100.0000 5.3249 3844.9862
65 100.0000 7.0249 4844.9862
70 100.0000 9.2249 5844.9862
75 100.0000 12.0249 6844.9862
80 100.0000 15.5249 7844.9862
85 100.0000 19.7249 8844.9862
90 100.0000 24.5249 9844.9862
95 100.0000 29.9249 10844.9862
100 100.0000 35.9249 11844.9862
105 100.0000 42.5249 12844.9862
110 100.0000 49.7249 13844.9862
115 100.0000 57.5249 14844.9862
120 100.0000 65.9249 15844.9862
125 100.0000 74.9249 16844.9862
130 100.0000 84.5249 17844.9862
135 100.0000 94.7249 18844.9862
140 100.0000 105.5249 19844.9862

```



SINGLE #9  
ATCRBS  
20,8 equivalent





```

RUN IN: SINGLE
ENTER NUMBER OF MEASUREMENTS -->4
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO12
3..ALF10
4..ALF12
5..THU1
6..PHO10
7..BETA

ENTER NUMBERS -->1,3,5,6
1
3
5
6
SIGMA RHO10 (FT) -->100
SIGMA ALF10 (DEG) -->1.768
SIGMA RHO12 (FT) -->100
SIGMA THU1 (DEG) -->100
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE(M), BEARING(DEG) AND HEIGHT(FT) -->20,8,0,0,20.
VECTOR RHO12 --> 20.000 0.000 0.000

INPUT (COUNT) POSITION RELATIVE TO RADAR (1)
DISTANCE(M), BEARING(DEG) AND ALTITUDE(FT) -->20,60.
VECTOR RHO10 --> 10.000 17.321 0.000

INPUT (TARGET) POSITION RELATIVE TO (COUNT)
DISTANCE(M), BEARING(DEG) AND ALTITUDE(FT) -->8.
BETA START, INCREMENT (DEG) -->0.5

BETA RANGE BEARING CEP
0 100.0000 0.3818 338.9784
5 100.0000 0.4114 363.0761
10 100.0000 0.4474 392.5538
15 100.0000 0.4920 429.2233
20 100.0000 0.5483 475.8033
25 100.0000 0.6214 536.5668
30 100.0000 0.7196 618.6348
35 100.0000 0.8551 734.8237
40 100.0000 1.0670 910.7626
45 100.0000 1.4169 1206.2465
50 100.0000 2.1192 1800.6455
55 100.0000 4.2309 3590.7893
60 100.0000 0.1768 180.2731
65 100.0000 4.2309 3590.7893
70 100.0000 2.1192 1800.6455
75 100.0000 1.4169 1206.2461
80 100.0000 1.0670 910.7626
85 100.0000 0.8581 734.8237
90 100.0000 0.7196 618.6348
95 100.0000 0.6214 536.5668
100 100.0000 0.5483 475.8033
105 100.0000 0.4920 429.2233
110 100.0000 0.4474 392.5538
115 100.0000 0.4114 363.0761
120 100.0000 0.3818 338.9784
125 100.0000 0.3571 319.0082
130 100.0000 0.3362 302.2727
135 100.0000 0.3185 288.1195
140 100.0000 0.3033 276.0628
145 100.0000 0.2902 266.8640

```

```

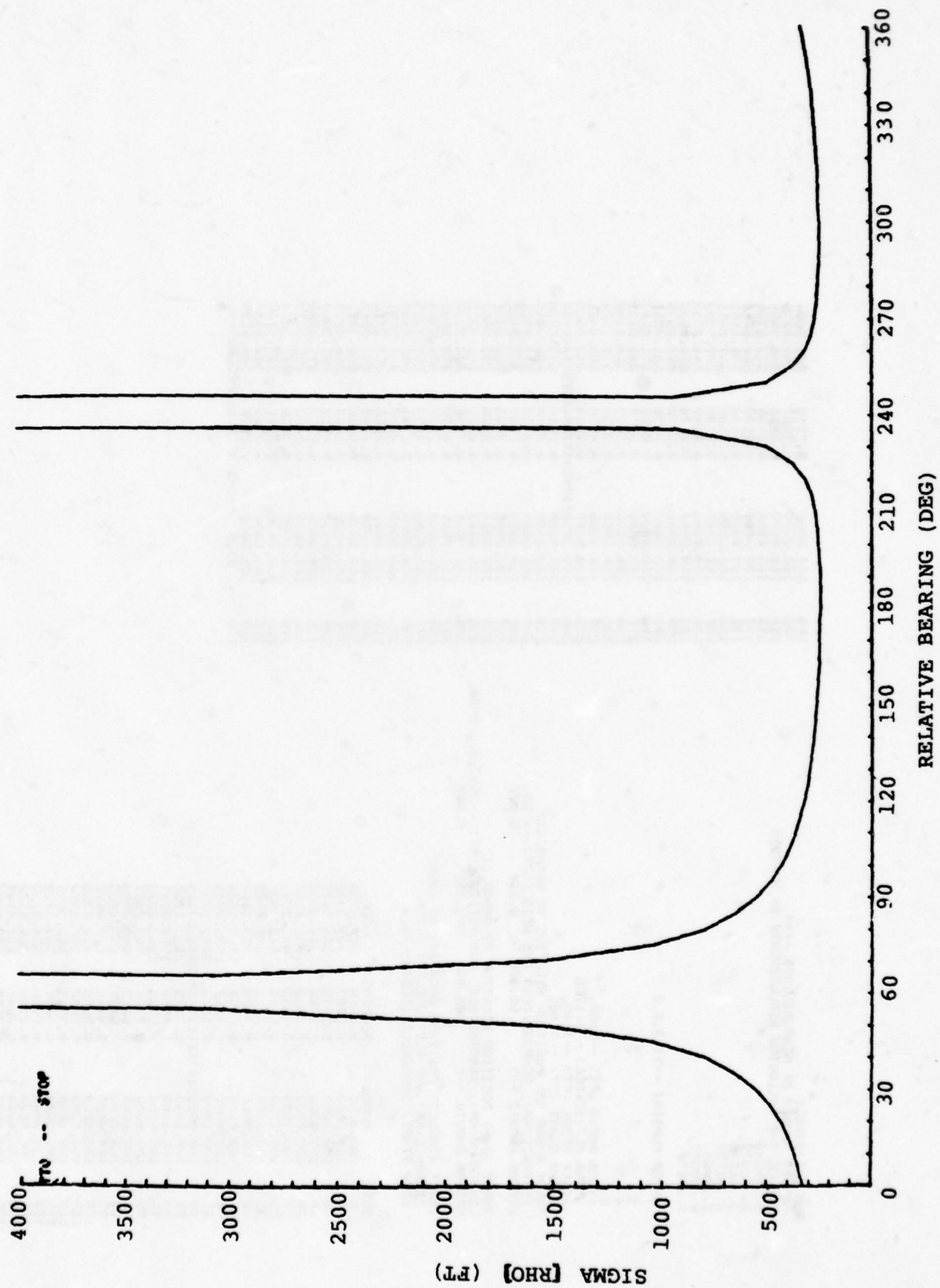
150 100.0000 0.2789 256.8640
155 100.0000 0.2691 248.2050
160 100.0000 0.2606 242.6229
165 100.0000 0.2532 238.9845
170 100.0000 0.2470 236.2633
175 100.0000 0.2418 234.2857
180 100.0000 0.2376 232.6552
185 100.0000 0.2339 231.1844
190 100.0000 0.2306 229.7825
195 100.0000 0.2271 228.4356
200 100.0000 0.2233 227.1476
205 100.0000 0.2194 225.9184
210 100.0000 0.2152 224.7432
215 100.0000 0.2108 223.6188
220 100.0000 0.2062 222.5409
225 100.0000 0.2014 221.5149
230 100.0000 0.1964 220.5362
235 100.0000 0.1912 219.6000
240 100.0000 0.1858 218.7025
245 100.0000 0.1802 217.8500
250 100.0000 0.1744 217.0388
255 100.0000 0.1684 216.2656
260 100.0000 0.1622 215.5269
265 100.0000 0.1558 214.8199
270 100.0000 0.1492 214.1412
275 100.0000 0.1424 213.4876
280 100.0000 0.1354 212.8552
285 100.0000 0.1282 212.2400
290 100.0000 0.1208 211.6388
295 100.0000 0.1132 211.0488
300 100.0000 0.1054 210.4668
305 100.0000 0.0974 209.8896
310 100.0000 0.0892 209.3140
315 100.0000 0.0808 208.7376
320 100.0000 0.0722 208.1568
325 100.0000 0.0634 207.5688
330 100.0000 0.0544 206.9708
335 100.0000 0.0452 206.3608
340 100.0000 0.0358 205.7348
345 100.0000 0.0262 205.0896
350 100.0000 0.0164 204.4320
355 100.0000 0.0064 203.7592
360 100.0000 0.0000 203.0688
365 100.0000 0.0000 202.3584
370 100.0000 0.0000 201.6264
375 100.0000 0.0000 200.8712
380 100.0000 0.0000 200.0912
385 100.0000 0.0000 199.2848
390 100.0000 0.0000 198.4608
395 100.0000 0.0000 197.6176
400 100.0000 0.0000 196.7536
405 100.0000 0.0000 195.8672
410 100.0000 0.0000 194.9568
415 100.0000 0.0000 194.0208
420 100.0000 0.0000 193.0584
425 100.0000 0.0000 192.0688
430 100.0000 0.0000 191.0504
435 100.0000 0.0000 190.0016
440 100.0000 0.0000 188.9216
445 100.0000 0.0000 187.8096
450 100.0000 0.0000 186.6648
455 100.0000 0.0000 185.4864
460 100.0000 0.0000 184.2736
465 100.0000 0.0000 183.0256
470 100.0000 0.0000 181.7424
475 100.0000 0.0000 180.4232
480 100.0000 0.0000 179.0672
485 100.0000 0.0000 177.6736
490 100.0000 0.0000 176.2416
495 100.0000 0.0000 174.7704
500 100.0000 0.0000 173.2592
505 100.0000 0.0000 171.7072
510 100.0000 0.0000 170.1136
515 100.0000 0.0000 168.4784
520 100.0000 0.0000 166.7912
525 100.0000 0.0000 165.0512
530 100.0000 0.0000 163.2576
535 100.0000 0.0000 161.4096
540 100.0000 0.0000 159.5160
545 100.0000 0.0000 157.5768
550 100.0000 0.0000 155.5912
555 100.0000 0.0000 153.5584
560 100.0000 0.0000 151.4776
565 100.0000 0.0000 149.3488
570 100.0000 0.0000 147.1712
575 100.0000 0.0000 144.9448
580 100.0000 0.0000 142.6688
585 100.0000 0.0000 140.3432
590 100.0000 0.0000 137.9680
595 100.0000 0.0000 135.5424
600 100.0000 0.0000 133.0664
605 100.0000 0.0000 130.5392
610 100.0000 0.0000 127.9608
615 100.0000 0.0000 125.3304
620 100.0000 0.0000 122.6480
625 100.0000 0.0000 119.9128
630 100.0000 0.0000 117.1248
635 100.0000 0.0000 114.2832
640 100.0000 0.0000 111.3872
645 100.0000 0.0000 108.4368
650 100.0000 0.0000 105.4312
655 100.0000 0.0000 102.3704
660 100.0000 0.0000 99.2536
665 100.0000 0.0000 96.0808
670 100.0000 0.0000 92.8520
675 100.0000 0.0000 89.5672
680 100.0000 0.0000 86.2264
685 100.0000 0.0000 82.8296
690 100.0000 0.0000 79.3768
695 100.0000 0.0000 75.8680
700 100.0000 0.0000 72.3032
705 100.0000 0.0000 68.6824
710 100.0000 0.0000 65.0056
715 100.0000 0.0000 61.2728
720 100.0000 0.0000 57.4840
725 100.0000 0.0000 53.6392
730 100.0000 0.0000 49.7384
735 100.0000 0.0000 45.7816
740 100.0000 0.0000 41.7688
745 100.0000 0.0000 37.7000
750 100.0000 0.0000 33.5752
755 100.0000 0.0000 29.3936
760 100.0000 0.0000 25.1552
765 100.0000 0.0000 20.8600
770 100.0000 0.0000 16.5072
775 100.0000 0.0000 12.0960
780 100.0000 0.0000 7.7264
785 100.0000 0.0000 3.2984
790 100.0000 0.0000 0.0000
795 100.0000 0.0000 0.0000
800 100.0000 0.0000 0.0000
805 100.0000 0.0000 0.0000
810 100.0000 0.0000 0.0000
815 100.0000 0.0000 0.0000
820 100.0000 0.0000 0.0000
825 100.0000 0.0000 0.0000
830 100.0000 0.0000 0.0000
835 100.0000 0.0000 0.0000
840 100.0000 0.0000 0.0000
845 100.0000 0.0000 0.0000
850 100.0000 0.0000 0.0000
855 100.0000 0.0000 0.0000
860 100.0000 0.0000 0.0000
865 100.0000 0.0000 0.0000
870 100.0000 0.0000 0.0000
875 100.0000 0.0000 0.0000
880 100.0000 0.0000 0.0000
885 100.0000 0.0000 0.0000
890 100.0000 0.0000 0.0000
895 100.0000 0.0000 0.0000
900 100.0000 0.0000 0.0000
905 100.0000 0.0000 0.0000
910 100.0000 0.0000 0.0000
915 100.0000 0.0000 0.0000
920 100.0000 0.0000 0.0000
925 100.0000 0.0000 0.0000
930 100.0000 0.0000 0.0000
935 100.0000 0.0000 0.0000
940 100.0000 0.0000 0.0000
945 100.0000 0.0000 0.0000
950 100.0000 0.0000 0.0000
955 100.0000 0.0000 0.0000
960 100.0000 0.0000 0.0000
965 100.0000 0.0000 0.0000
970 100.0000 0.0000 0.0000
975 100.0000 0.0000 0.0000
980 100.0000 0.0000 0.0000
985 100.0000 0.0000 0.0000
990 100.0000 0.0000 0.0000
995 100.0000 0.0000 0.0000
1000 100.0000 0.0000 0.0000

```

-- STOP --END OF BCAS PROGRAM--



SINGLE #9  
50,10 equivalent  
ATCRBS





RUN IN SINGLE  
ENTER NUMBER OF MEASUREMENTS -->4  
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:

1. RHO10
2. RHO12
3. RHO14
4. ALF10
5. TAU1
6. TAU2
7. BETA

ENTER NUMBERS -->1,3,5,6

- 1
- 3
- 5
- 6

SIGMA RHO10 (FT) -->100  
SIGMA ALF10 (DEG) -->1.768  
SIGMA TAU1 (FT) -->100  
SIGMA RHO12 (FT) -->100  
SIGMA RHO14 (FT) -->100  
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)  
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) -->50, 0.000 0.000  
VECTOR RHO12 --> 50.000 0.000 0.000

INPUT (CUN) POSITION RELATIVE TO RADAR (1)  
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->50.0, 0.0, 0.60  
VECTOR RHO10 --> 25.000 43.301 0.000

INPUT (TARGET) POSITION RELATIVE TO (CUN)  
DISTANCE (NM) AND ALTITUDE (FT) -->10.  
BETA START, INCREMENT (DEG) -->0.5

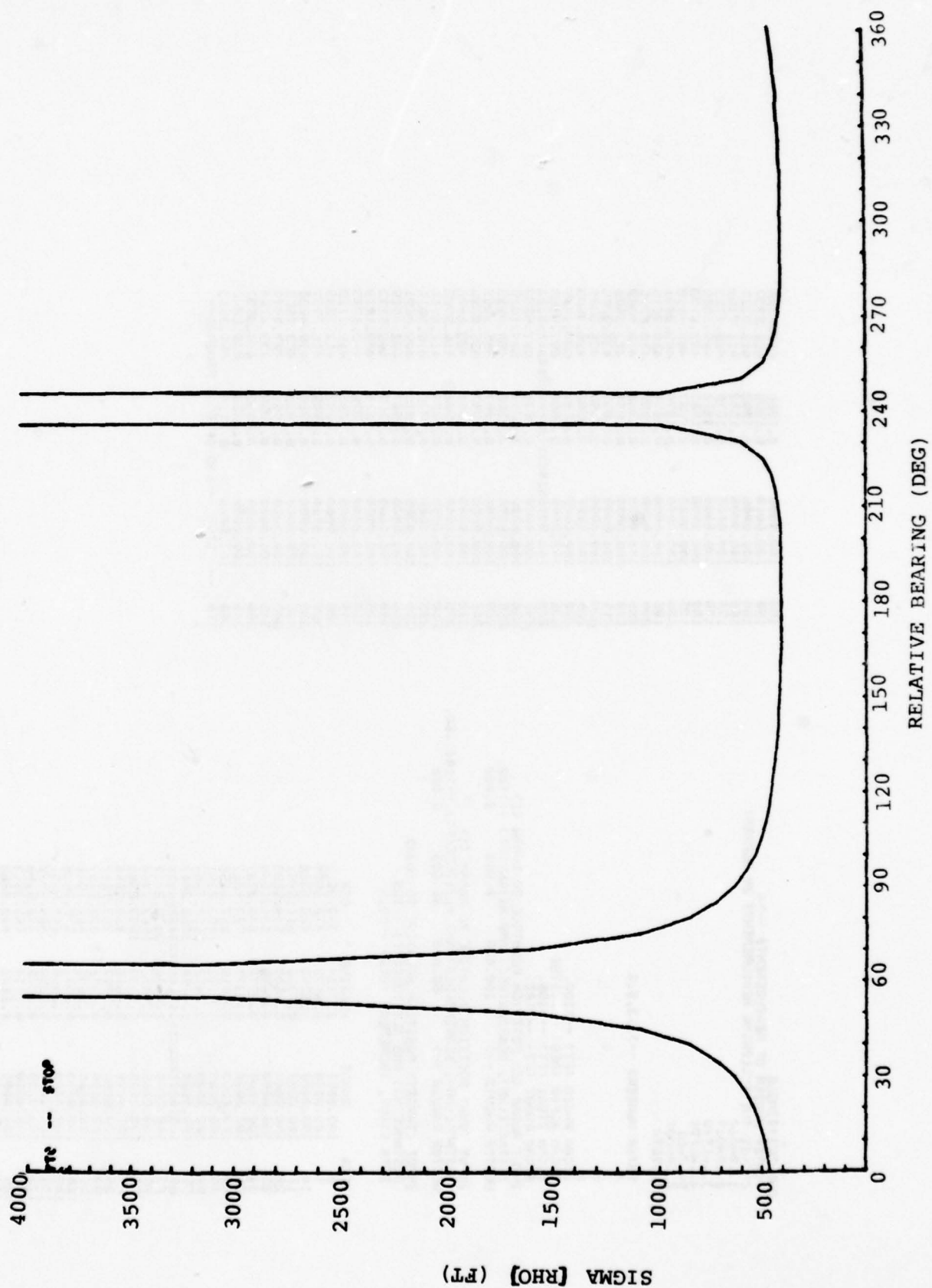
BETA	RANGE	BEARING	CEP
0	100.0000	0.2015	324.8730
5	100.0000	0.3097	343.3492
10	100.0000	0.3323	366.3075
15	100.0000	0.3606	395.2550
20	100.0000	0.3869	432.6388
25	100.0000	0.4446	482.0015
30	100.0000	0.5095	549.4905
35	100.0000	0.6010	646.0989
40	100.0000	0.7426	793.8667
45	100.0000	0.9798	1043.8826
50	100.0000	1.4586	1550.0941
55	100.0000	2.0030	2081.1752
60	100.0000	2.0030	2081.1752
65	100.0000	2.0030	2081.1752
70	100.0000	1.4586	1550.0941
75	100.0000	0.9798	1043.8826
80	100.0000	0.7426	793.8667
85	100.0000	0.6010	646.0989
90	100.0000	0.5095	549.4905
95	100.0000	0.4446	482.0015
100	100.0000	0.3869	432.6388
105	100.0000	0.3606	395.2550
110	100.0000	0.3323	366.3075
115	100.0000	0.3097	343.3492
120	100.0000	0.2015	324.8730
125	100.0000	0.2765	309.8134
130	100.0000	0.2641	297.4147
135	100.0000	0.2538	287.1294
140	100.0000	0.2452	278.5533
145	100.0000	0.2370	271.3852

150	100.0000	0.8219	885.2004
155	100.0000	0.8267	888.4879
160	100.0000	0.8286	889.0788
165	100.0000	0.8166	883.0788
170	100.0000	0.8148	880.8161
175	100.0000	0.8138	847.8411
180	100.0000	0.8137	847.7373
185	100.0000	0.8147	848.6509
190	100.0000	0.8170	850.8696
195	100.0000	0.8210	854.8578
200	100.0000	0.8278	861.4281
205	100.0000	0.8386	872.0607
210	100.0000	0.8563	889.5681
215	100.0000	0.8867	920.0185
220	100.0000	0.9349	978.1628
225	100.0000	0.4710	509.4955
230	100.0000	0.8844	943.2510
235	100.0000	0.8844	943.2510
240	100.0000	0.8844	943.2510
245	100.0000	0.8844	943.2510
250	100.0000	0.8844	943.2510
255	100.0000	0.8844	943.2510
260	100.0000	0.8844	943.2510
265	100.0000	0.8844	943.2510
270	100.0000	0.8844	943.2510
275	100.0000	0.8844	943.2510
280	100.0000	0.8844	943.2510
285	100.0000	0.8844	943.2510
290	100.0000	0.8844	943.2510
295	100.0000	0.8844	943.2510
300	100.0000	0.8844	943.2510
305	100.0000	0.8844	943.2510
310	100.0000	0.8844	943.2510
315	100.0000	0.8844	943.2510
320	100.0000	0.8844	943.2510
325	100.0000	0.8844	943.2510
330	100.0000	0.8844	943.2510
335	100.0000	0.8844	943.2510
340	100.0000	0.8844	943.2510
345	100.0000	0.8844	943.2510
350	100.0000	0.8844	943.2510
355	100.0000	0.8844	943.2510
360	100.0000	0.8844	943.2510
TT0	100.0000	0.8844	943.2510

-- STOP --END OF BC66 PROGRAM--



SINGLE #9  
100,20 equivalent  
ATCRBS



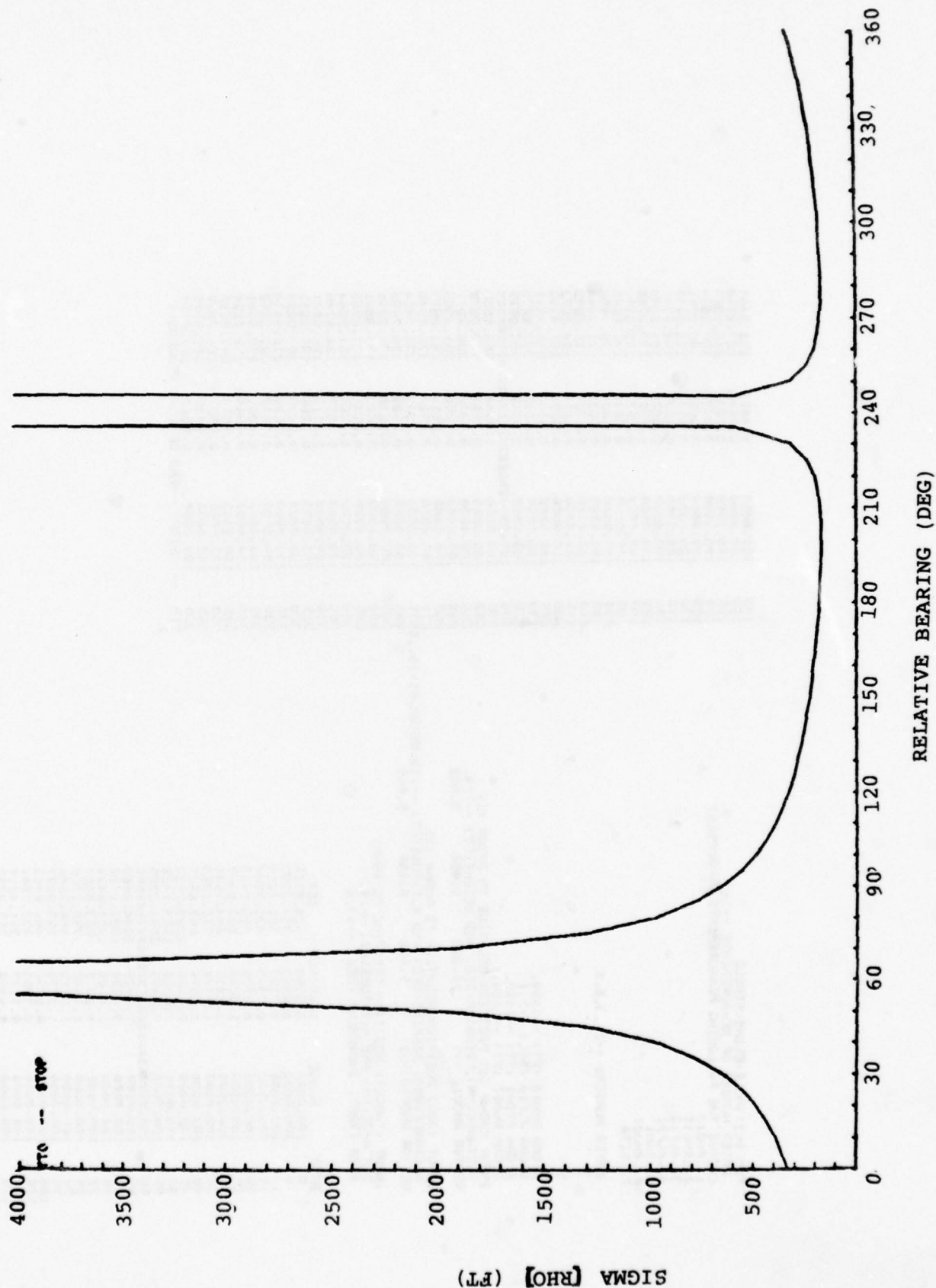


```

RUN DC11SINGL
ENTER NUMBER OF MEASUREMENTS -->4
USE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO1
2..RHO10
3..ALF10
4..ALF1
5..TAN1
6..RHO1
7..BETA
ENTER NUMBERS -->1,3,5,6
1
3
5
6
SIGMA RHO10 (FT) -->100.
SIGMA ALF10 (DEG) -->1.768
SIGMA DTAN1 (FT) -->100.
SIGMA RHO1 (FT) -->100.
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) -->100.
VECTOR RHO12 --> 100.000 0.000 0.000
INPUT (QUN) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->100.60.
VECTOR RHO13 --> 50.000 86.603 0.000
INPUT (TARGET) POSITION RELATIVE TO (QUN)
DISTANCE (NM) AND ALTITUDE (FT) -->20.
BETA START, INCREMENT (DEG) -->0.5
BETA RANGE BEARING CEP
0 100.0000 0.2114 459.3513
5 100.0000 0.2178 472.5990
10 100.0000 0.2250 488.5328
15 100.0000 0.2366 511.5851
20 100.0000 0.2507 540.9598
25 100.0000 0.2699 581.1941
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40 100.0000 0.4016 857.6656
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50 100.0000 0.7452 1583.7464
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100 100.0000 0.2366 511.5851
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130 100.0000 0.1989 433.4794
135 100.0000 0.1961 427.8470
140 100.0000 0.1939 423.2152
145 100.0000 0.1920 419.4020
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2060 
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SEMI-ACT  
SINGLE #9  
10,5 equivalent  
DABS



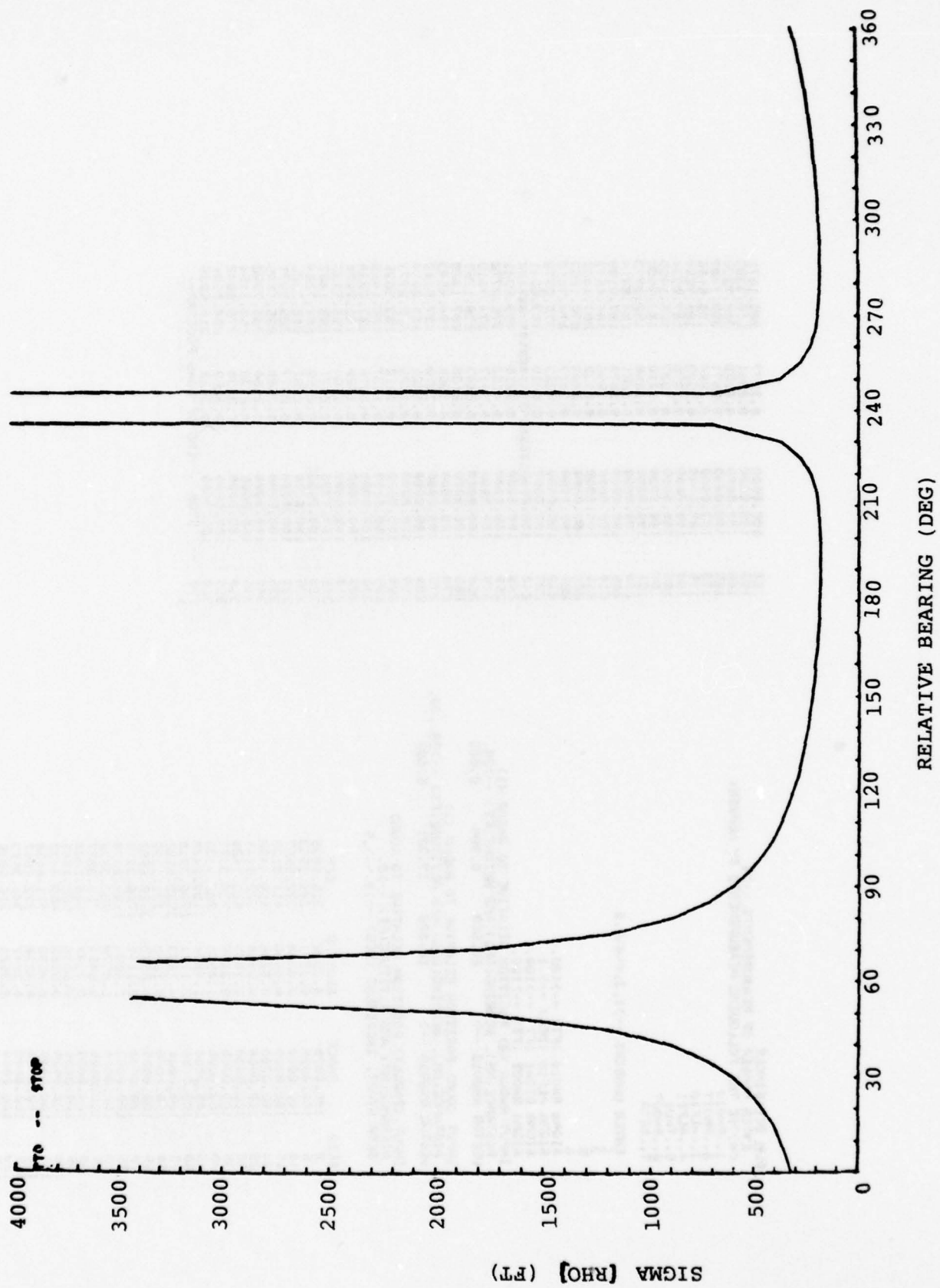


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*UPD ALL SINGLE-ELONG-SINGLE
ENTER NUMBER OF MEASUREMENTS -->4
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO11
3..ALF10
4..ALF11
5..TAU1
6..RHO12
7..BETA
ENTER NUMBERS -->1,3,5,6
1
3
5
6
SIGMA RHO10 (FT) -->100.
SIGMA ALF10 (DEG) -->.1
SIGMA DT01 (FT) -->100.
SIGMA RHO11 (FT) -->100.
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) -->10.
VECTOR RHO12 --> 10.000 0.000 0.000
INPUT (CMD) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->10. NS. GM. 01.10. 0.000
VECTOR RHO10 --> 5.000 8.660 0.000
INPUT (TARGET) POSITION RELATIVE TO (CMD)
DISTANCE (NM) AND ALTITUDE (FT) -->5.
BETA START, INCREMENT (DEG) -->0.5
BETA RANGE BEARING CEP
100.0000 0.5000 328.8754
5 100.0000 0.5468 357.2293
10 100.0000 0.7137 391.4214
15 100.0000 0.7953 433.3984
20 100.0000 0.8970 486.0463
25 100.0000 1.0276 553.9627
30 100.0000 1.2013 644.7644
35 100.0000 1.4440 772.1769
40 100.0000 1.8076 963.6527
45 100.0000 2.3128 1283.2494
50 100.0000 3.6220 1923.1420
55 100.0000 7.2475 3844.2089
60 100.0000 14.4950 7688.4178
65 100.0000 21.7425 11532.6267
70 100.0000 29.9850 15376.8356
75 100.0000 39.2275 19221.0445
80 100.0000 49.4700 23065.2534
85 100.0000 60.7125 26909.4623
90 100.0000 72.9550 30753.6712
95 100.0000 86.1975 34597.8801
100 100.0000 100.4400 38442.0890
105 100.0000 114.6825 42286.2979
110 100.0000 128.9250 46130.5068
115 100.0000 143.1675 49974.7157
120 100.0000 157.4100 53818.9246
125 100.0000 171.6525 57663.1335
130 100.0000 185.8950 61507.3424
135 100.0000 200.1375 65351.5513
140 100.0000 214.3800 69195.7602
145 100.0000 228.6225 73039.9691
150 100.0000 242.8650 76884.1780
155 100.0000 257.1075 80728.3869
160 100.0000 271.3500 84572.5958
165 100.0000 285.5925 88416.8047
170 100.0000 299.8350 92261.0136
175 100.0000 314.0775 96105.2225
180 100.0000 328.3200 99949.4314
185 100.0000 342.5625 103793.6403
190 100.0000 356.8050 107637.8492
195 100.0000 371.0475 111482.0581
200 100.0000 385.2900 115326.2670
205 100.0000 399.5325 119170.4759
210 100.0000 413.7750 123014.6848
215 100.0000 428.0175 126858.8937
220 100.0000 442.2600 130703.1026
225 100.0000 456.5025 134547.3115
230 100.0000 470.7450 138391.5204
235 100.0000 484.9875 142235.7293
240 100.0000 499.2300 146079.9382
245 100.0000 513.4725 149924.1471
250 100.0000 527.7150 153768.3560
255 100.0000 541.9575 157612.5649
260 100.0000 556.2000 161456.7738
265 100.0000 570.4425 165300.9827
270 100.0000 584.6850 169145.1916
275 100.0000 598.9275 172989.4005
280 100.0000 613.1700 176833.6094
285 100.0000 627.4125 180677.8183
290 100.0000 641.6550 184522.0272
295 100.0000 655.8975 188366.2361
300 100.0000 670.1400 192210.4450
305 100.0000 684.3825 196054.6539
310 100.0000 698.6250 199898.8628
315 100.0000 712.8675 203743.0717
320 100.0000 727.1100 207587.2806
325 100.0000 741.3525 211431.4895
330 100.0000 755.5950 215275.6984
335 100.0000 769.8375 219119.9073
340 100.0000 784.0800 222964.1162
345 100.0000 798.3225 226808.3251
350 100.0000 812.5650 230652.5340
355 100.0000 826.8075 234496.7429
360 100.0000 841.0500 238340.9518
365 100.0000 855.2925 242185.1607
370 100.0000 869.5350 246029.3696
375 100.0000 883.7775 249873.5785
380 100.0000 898.0200 253717.7874
385 100.0000 912.2625 257561.9963
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575 100.0000 1453.4775 403641.9345
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590 100.0000 1496.2050 415174.5612
595 100.0000 1510.4475 419018.7701
600 100.0000 1524.6900 422862.9790
605 100.0000 1538.9325 426707.1879
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670 100.0000 1724.0850 476681.9036
675 100.0000 1738.3275 480526.1125
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685 100.0000 1766.8125 488214.5303
690 100.0000 1781.0550 492058.7392
695 100.0000 1795.2975 495902.9481
700 100.0000 1809.5400 499747.1570
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710 100.0000 1838.0250 507435.5748
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855 100.0000 2251.0575 618917.6329
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870 100.0000 2293.7850 630450.2596
875 100.0000 2308.0275 634294.4685
880 100.0000 2322.2700 638138.6774
885 100.0000 2336.5125 641982.8863
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895 100.0000 2364.9975 649671.3041
900 100.0000 2379.2400 653515.5130
905 100.0000 2393.4825 657359.7219
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940 100.0000 2493.1800 684269.1842
945 100.0000 2507.4225 688113.3931
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975 100.0000 2592.8775 711178.6465
980 100.0000 2607.1200 715022.8554
985 100.0000 2621.3625 718867.0643
990 100.0000 2635.6050 722711.2732
995 100.0000 2649.8475 726555.4821
1000 100.0000 2664.0900 730399.6910
1005 100.0000 2678.3325 734243.8999
1010 100.0000 2692.5750 738088.1088
1015 100.0000 2706.8175 741932.3177
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1025 100.0000 2735.3025 749620.7355
1030 100.0000 2749.5450 753464.9444
1035 100.0000 2763.7875 757309.1533
1040 100.0000 2778.0300 761153.3622
1045 100.0000 2792.2725 764997.5711
1050 100.0000 2806.5150 768841.7800
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1090 100.0000 2920.4550 799595.4512
1095 100.0000 2934.6975 803439.6601
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1105 100.0000 2963.1825 811128.0779
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1115 100.0000 2991.6675 818816.4957
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1125 100.0000 3020.1525 826504.9135
1130 100.0000 3034.3950 830349.1224
1135 100.0000 3048.6375 834193.3313
1140 100.0000 3062.8800 838037.5402
1145 100.0000 3077.1225 841881.7491
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1350 100.0000 3661.0650 999494.3140
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1440 100.0000 3917.4300 1068690.0742
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1450 100.0000 3945.9150 1076378.4920
1455 100.0000 3960.1575 1080222.7009
1460 100.0000 3974.4000 1084066.9098
1465 100.0000 3988.6425 1087911.1187
1470 100.0000 4002.8850 1091755.3276
1475 100.0000 4017.1275 1095599.5365
1480 100.0000 4031.3700 1099443.7454
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1490 100.0000 4059.8550 1107132.1632
1495 100.0000 4074.0975 1110976.3721
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1505 100.0000 4102.5825 1118664.7899
1510 100.0000 4116.8250 1122508.9988
1515 100.0000 4131.0675 1126353.2077
1520 100.0000 4145.3100 1130197.4166
1525 100.0000 4159.5525 1134041.6255
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1540 100.0000 4202.2800 1145574.2522
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1550 100.0000 4230.7650 1153262.6700
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1585 100.0000 4330.4625 1180172.1323
1590 100.0000 4344.7050 1184016.3412
1595 100.0000 4358.9475 1187860.5501
1600 100.0000 4373.1900 1191704.7590
1605 100.0000 4387.4325 1195548.9679
1610 100.0000 4401.6750 1199393.1768
1615 100.0000 4415.9175 1203237.3857
1620 100.0000 4430.1600 1207081.5946
1625 100.0000 4444.4025 1210925.8035
1630 100.0000 4458.6450 1214769.0124
1635 100.0000 4472.8875 1218613.2213
1640 100.0000 4487.1300 1222457.4302
1645 100.0000 4501.3725 1226301.6391
1650 100.0000 4515.6150 1230145.8480
1655 100.0000 4529.8575 1233990.0569
1660 100.0000 4544.1000 1237834.2658
1665 100.0000 4558.3425 1241678.4747
1670 100.0000 4572.5850 1245522.6836
1675 100.0000 4586.8275 1249366.8925
1680 100.0000 4601.0700 1253211.1014
1685 100.0000 4615.3125 1257055.3103
1690 100.0000 4629.5550 1260899.5192
1695 100.0000 4643.7975 1264743.7281
1700 100.0000 4658.0400 1268587.9370
1705 100.0000 4672.2825 
```



SINGLE #9  
20.8 equivalent  
DABS





PAGE 111: SINGLE  
ENTER NUMBER OF MEASUREMENTS -->4  
(NAME THE FOLLOWING MEASUREMENTS BY NUMBER:

1..RHO1  
2..RHO2  
3..ALPHA  
4..ALPHA  
5..THETA  
6..RHO1  
7..BETA

ENTER NUMBERS -->1,3,4,5,6

SIGMA RHO10 (FT) -->100.

SIGMA ALPHA (DEG) -->1.

SIGMA DTOM1 (FT) -->100.

SIGMA RHOOT (FT) -->100.

INPUT RADAR <2> POSITION RELATIVE TO RADAR <1>

DISTANCE(N), BEARING(DEG) AND HEIGHT(FT) -->20.

VECTOR RHO1:2 --> 20.000 0.000 0.000

INPUT <OWN> POSITION RELATIVE TO RADAR <1>

DISTANCE(N), BEARING(DEG) AND ALTITUDE(FT) -->20.00.

VECTOR RHO1:0 --> 10.000 17.321 0.000

INPUT <TARGET> POSITION RELATIVE TO <OWN>

DISTANCE(N), BEARING(DEG) AND ALTITUDE(FT) -->8.

BETA START, INCREMENT (DEG) -->0.1, .5

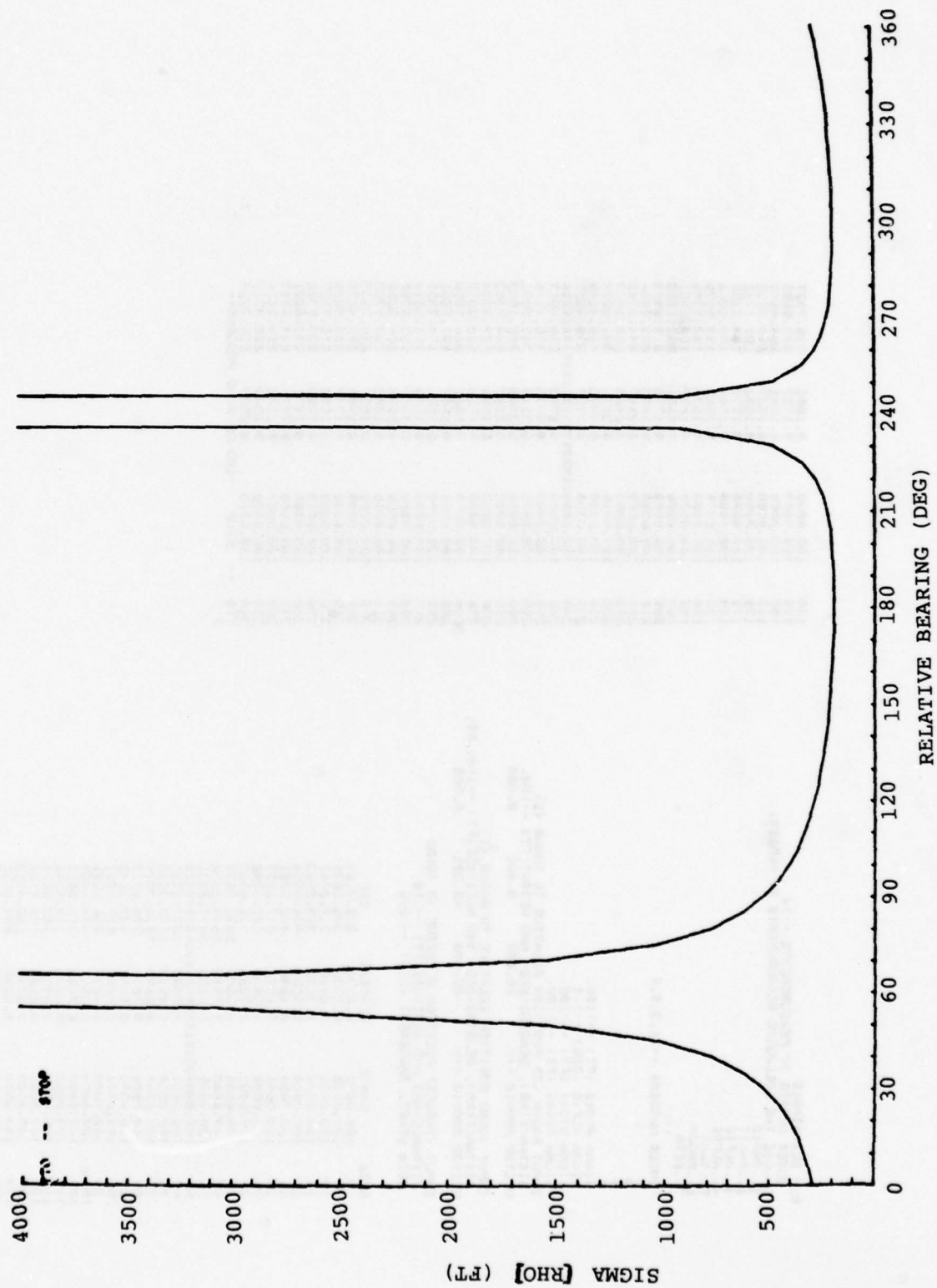
BETA	RANGE	BEARING	CEP
0	100.0000	0.3528	315.6035
5	100.0000	0.3847	341.3553
10	100.0000	0.4230	372.5557
15	100.0000	0.4690	411.0132
20	100.0000	0.5206	459.4432
25	100.0000	0.5840	522.1141
30	100.0000	0.7047	606.1420
35	100.0000	0.8456	724.3377
40	100.0000	1.0570	902.3236
45	100.0000	1.4094	1199.8870
50	100.0000	2.1141	1796.3918
55	100.0000	4.2283	3588.6582
60	100.0000	0.1000	131.1396
65	100.0000	4.2283	3588.6582
70	100.0000	2.1141	1796.3918
75	100.0000	1.4094	1199.8870
80	100.0000	1.0570	902.3236
85	100.0000	0.8456	724.3377
90	100.0000	0.7047	606.1420
95	100.0000	0.5840	522.1141
100	100.0000	0.5206	459.4432
105	100.0000	0.4690	411.0132
110	100.0000	0.4230	372.5557
115	100.0000	0.3847	341.3553
120	100.0000	0.3528	315.6035
125	100.0000	0.3259	294.0501
130	100.0000	0.3030	275.8042
135	100.0000	0.2832	260.2154
140	100.0000	0.2660	246.7932
145	100.0000	0.2509	235.1895

150	100.0000	0.2377	225.1071
155	100.0000	0.2261	216.3385
160	100.0000	0.2159	208.7224
165	100.0000	0.2071	202.1407
170	100.0000	0.1994	196.5135
175	100.0000	0.1929	191.7084
180	100.0000	0.1876	187.5934
185	100.0000	0.1829	183.3695
190	100.0000	0.1790	179.5109
195	100.0000	0.1758	175.7772
200	100.0000	0.1732	172.6719
205	100.0000	0.1712	169.8034
210	100.0000	0.1696	167.1459
215	100.0000	0.1685	164.6414
220	100.0000	0.1678	162.2773
225	100.0000	0.1673	160.0414
230	100.0000	0.1670	157.9183
235	100.0000	0.1668	155.9027
240	100.0000	0.1667	154.0000
245	100.0000	0.1667	152.2000
250	100.0000	0.1667	150.5000
255	100.0000	0.1667	148.9000
260	100.0000	0.1667	147.4000
265	100.0000	0.1667	146.0000
270	100.0000	0.1667	144.7000
275	100.0000	0.1667	143.5000
280	100.0000	0.1667	142.4000
285	100.0000	0.1667	141.4000
290	100.0000	0.1667	140.5000
295	100.0000	0.1667	139.7000
300	100.0000	0.1667	139.0000
305	100.0000	0.1667	138.4000
310	100.0000	0.1667	137.9000
315	100.0000	0.1667	137.5000
320	100.0000	0.1667	137.2000
325	100.0000	0.1667	137.0000
330	100.0000	0.1667	136.8000
335	100.0000	0.1667	136.7000
340	100.0000	0.1667	136.6000
345	100.0000	0.1667	136.5000
350	100.0000	0.1667	136.4000
355	100.0000	0.1667	136.3000
360	100.0000	0.1667	136.2000
365	100.0000	0.1667	136.1000
370	100.0000	0.1667	136.0000

-- STOP --END OF BCAS PROGRAM--



SINGLE #9  
50,10 equivalent  
DABS





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RUN IN INFINITE
ENTER NUMBER OF MEASUREMENTS -->4
ENTER THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO1
2..RHO2
3..ALF1
4..ALF2
5..THU1
6..THU2
7..BETA
ENTER NUMBERS -->1,3,5,6
1
3
5
6
SIGMA RHO10 (FT) -->100.
SIGMA ALF10 (DEG) -->1.
SIGMA THO1 (FT) -->100.
SIGMA THO1 (DEG) -->100.
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE (MI), BEARING (DEG) AND HEIGHT (FT) -->50.
VECTOR RHO12 --> 50.000 0.000 0.000
INPUT (UND) POSITION RELATIVE TO RADAR (1)
DISTANCE (MI), BEARING (DEG) AND ALTITUDE (FT) -->50..60.
(VECTOR RHO10 --> 25.000 43.361 0.000
INPUT (TARGET) POSITION RELATIVE TO (UND)
DISTANCE (MI) AND ALTITUDE (FT) -->10.
BETA START, INCREMENT (DEG) -->0.5
BETA RANGE BEARING CEP
0 100.0000 0.2524 285.7184
5 100.0000 0.2733 305.5635
10 100.0000 0.2986 332.8748
15 100.0000 0.3298 363.8083
20 100.0000 0.3692 404.0654
25 100.0000 0.4200 456.5281
30 100.0000 0.4882 527.2877
35 100.0000 0.5840 627.3248
40 100.0000 0.7281 778.0923
45 100.0000 0.9589 1032.3679
50 100.0000 1.4513 1542.3632
55 100.0000 2.0003 2077.2931
60 100.0000 2.5003 2677.2931
65 100.0000 2.9503 3277.2931
70 100.0000 3.3513 3842.3632
75 100.0000 3.7019 4352.3679
80 100.0000 4.0021 4812.3679
85 100.0000 4.2527 5227.2931
90 100.0000 4.4532 5602.3679
95 100.0000 4.6032 5927.2931
100 100.0000 4.7032 6202.3679
105 100.0000 4.7532 6427.2931
110 100.0000 4.7532 6602.3679
115 100.0000 4.7032 6727.2931
120 100.0000 4.5032 6802.3679
125 100.0000 4.2527 6827.2931
130 100.0000 3.9532 6802.3679
135 100.0000 3.6032 6727.2931
140 100.0000 3.2032 6602.3679
145 100.0000 2.7532 6427.2931

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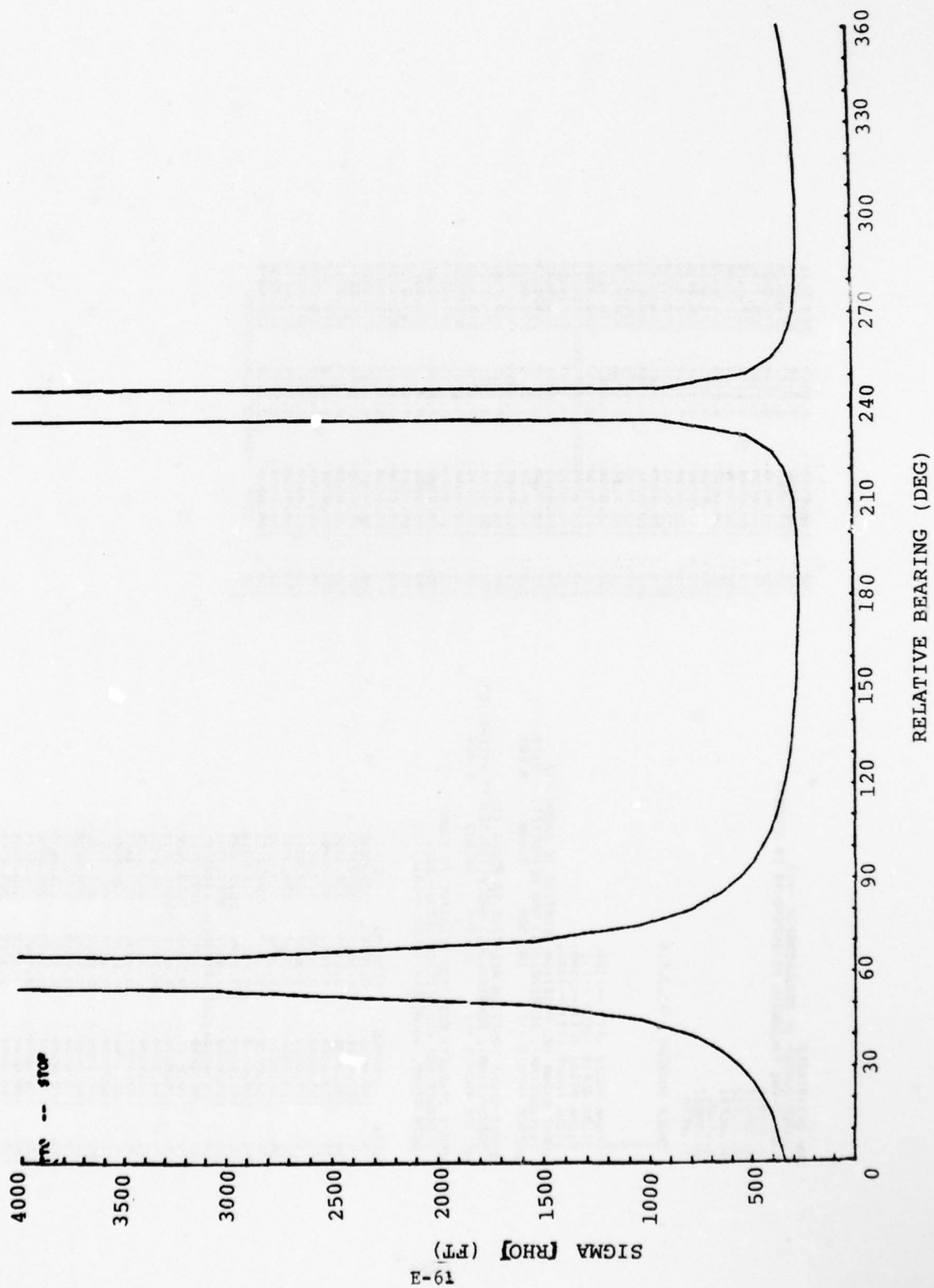
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155 100.0000 0.1737 800.5895
160 100.0000 0.1682 784.4879
165 100.0000 0.1637 768.3828
170 100.0000 0.1592 752.2748
175 100.0000 0.1547 736.1683
180 100.0000 0.1502 720.0654
185 100.0000 0.1457 703.9650
190 100.0000 0.1412 687.8679
195 100.0000 0.1367 671.7701
200 100.0000 0.1322 655.6751
205 100.0000 0.1277 639.5828
210 100.0000 0.1232 623.4934
215 100.0000 0.1187 607.4069
220 100.0000 0.1142 591.3234
225 100.0000 0.1097 575.2428
230 100.0000 0.1052 559.1643
235 100.0000 0.1007 543.0878
240 100.0000 0.0962 527.0143
245 100.0000 0.0917 510.9428
250 100.0000 0.0872 494.8734
255 100.0000 0.0827 478.8069
260 100.0000 0.0782 462.7434
265 100.0000 0.0737 446.6828
270 100.0000 0.0692 430.6243
275 100.0000 0.0647 414.5678
280 100.0000 0.0602 398.5143
285 100.0000 0.0557 382.4628
290 100.0000 0.0512 366.4143
295 100.0000 0.0467 350.3678
300 100.0000 0.0422 334.3243
305 100.0000 0.0377 318.2828
310 100.0000 0.0332 302.2428
315 100.0000 0.0287 286.2043
320 100.0000 0.0242 270.1678
325 100.0000 0.0197 254.1334
330 100.0000 0.0152 238.1009
335 100.0000 0.0107 222.0694
340 100.0000 0.0062 206.0399
345 100.0000 0.0017 190.0124
350 100.0000 0.0012 173.9869
355 100.0000 0.0007 157.9634
360 100.0000 0.0002 141.9419
365 100.0000 0.0000 125.9224
370 100.0000 0.0000 109.9049
375 100.0000 0.0000 93.8884
380 100.0000 0.0000 77.8729
385 100.0000 0.0000 61.8584
390 100.0000 0.0000 45.8449
395 100.0000 0.0000 29.8324
400 100.0000 0.0000 13.8209
405 100.0000 0.0000 0.0000
410 100.0000 0.0000 0.0000
415 100.0000 0.0000 0.0000
420 100.0000 0.0000 0.0000
425 100.0000 0.0000 0.0000
430 100.0000 0.0000 0.0000
435 100.0000 0.0000 0.0000
440 100.0000 0.0000 0.0000
445 100.0000 0.0000 0.0000
450 100.0000 0.0000 0.0000
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460 100.0000 0.0000 0.0000
465 100.0000 0.0000 0.0000
470 100.0000 0.0000 0.0000
475 100.0000 0.0000 0.0000
480 100.0000 0.0000 0.0000
485 100.0000 0.0000 0.0000
490 100.0000 0.0000 0.0000
495 100.0000 0.0000 0.0000
500 100.0000 0.0000 0.0000
505 100.0000 0.0000 0.0000
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525 100.0000 0.0000 0.0000
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535 100.0000 0.0000 0.0000
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765 100.0000 0.0000 0.0000
770 100.0000 0.0000 0.0000
775 100.0000 0.0000 0.0000
780 100.0000 0.0000 0.0000
785 100.0000 0.0000 0.0000
790 100.0000 0.0000 0.0000
795 100.0000 0.0000 0.0000
800 100.0000 0.0000 0.0000
805 100.0000 0.0000 0.0000
810 100.0000 0.0000 0.0000
815 100.0000 0.0000 0.0000
820 100.0000 0.0000 0.0000
825 100.0000 0.0000 0.0000
830 100.0000 0.0000 0.0000
835 100.0000 0.0000 0.0000
840 100.0000 0.0000 0.0000
845 100.0000 0.0000 0.0000
850 100.0000 0.0000 0.0000
855 100.0000 0.0000 0.0000
860 100.0000 0.0000 0.0000
865 100.0000 0.0000 0.0000
870 100.0000 0.0000 0.0000
875 100.0000 0.0000 0.0000
880 100.0000 0.0000 0.0000
885 100.0000 0.0000 0.0000
890 100.0000 0.0000 0.0000
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945 100.0000 0.0000 0.0000
950 100.0000 0.0000 0.0000
955 100.0000 0.0000 0.0000
960 100.0000 0.0000 0.0000
965 100.0000 0.0000 0.0000
970 100.0000 0.0000 0.0000
975 100.0000 0.0000 0.0000
980 100.0000 0.0000 0.0000
985 100.0000 0.0000 0.0000
990 100.0000 0.0000 0.0000
995 100.0000 0.0000 0.0000
1000 100.0000 0.0000 0.0000

```

-- STOP --END OF BCMS PROGRAM--



SINGLE #9  
100,20 equivalent  
DABs





RUN D1181818  
 ENTER NUMBER OF MEASUREMENTS -->4  
 CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:

1...RHO10  
 2...RHO11  
 3...ALPHA  
 4...ALPHA  
 5...RHO1  
 6...RHO1  
 7...BETA

ENTER NUMBERS -->1,3,5,6

1  
 2  
 3  
 4  
 5  
 6  
 SIGMA RHO10 (FT) -->100.  
 SIGMA ALPHA (DEG) -->1.  
 SIGMA RHO11 (FT) -->100.  
 SIGMA ALPHA (DEG) -->100.  
 INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)  
 DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) -->100.  
 VECTOR RHO12 --> 100.000 0.000 0.000

INPUT (4) POSITION RELATIVE TO RADAR (1)  
 DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->100.00.  
 VECTOR RHO10 --> 50.000 86.603 0.000

INPUT (TARGET) POSITION RELATIVE TO (COUNT)  
 DISTANCE (NM) AND ALTITUDE (FT) -->20.  
 BETA START, INCREMENT (DEG) -->0.1, .5

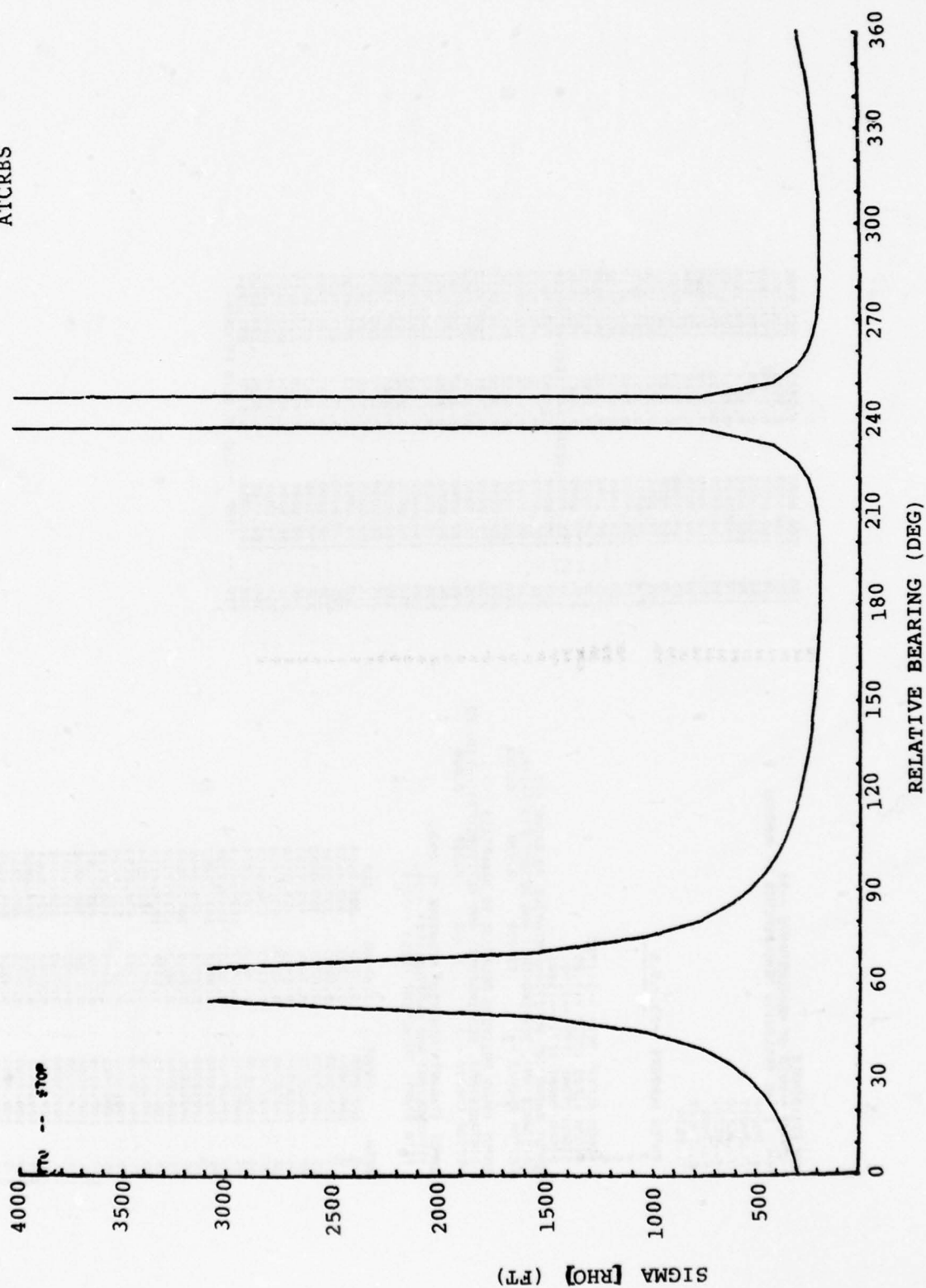
BETA	RANGE	BEARING	CEP
5	100.0000	0.1530	339.6670
10	100.0000	0.1618	357.3791
15	100.0000	0.1726	379.4896
20	100.0000	0.1853	407.5495
25	100.0000	0.2030	443.8553
30	100.0000	0.2272	492.0941
35	100.0000	0.2509	558.3645
40	100.0000	0.3046	653.6628
45	100.0000	0.3742	799.9752
50	100.0000	0.4921	1048.5810
55	100.0000	0.7368	1553.2650
60	100.0000	1.4527	3082.7701
65	100.0000	1.4527	3082.7701
70	100.0000	0.7368	1553.2650
75	100.0000	0.4921	1048.5810
80	100.0000	0.3742	799.9752
85	100.0000	0.3046	653.6628
90	100.0000	0.2509	558.3645
95	100.0000	0.2272	492.0941
100	100.0000	0.2030	443.8553
105	100.0000	0.1853	407.5495
110	100.0000	0.1726	379.4896
115	100.0000	0.1618	357.3791
120	100.0000	0.1530	339.6670
125	100.0000	0.1459	325.2930
130	100.0000	0.1401	313.5071
135	100.0000	0.1362	303.7671
140	100.0000	0.1312	295.6740
145	100.0000	0.1278	288.9310

100.0000	0.1259	282.3181
100.0000	0.1197	270.8644
100.0000	0.1108	257.1899
100.0000	0.1108	243.4782
100.0000	0.1172	229.8172
100.0000	0.1167	216.1309
100.0000	0.1166	202.4389
100.0000	0.1171	188.7510
100.0000	0.1181	175.0630
100.0000	0.1231	161.3750
100.0000	0.1231	147.6870
100.0000	0.1281	134.0000
100.0000	0.1354	120.3120
100.0000	0.1508	106.6250
100.0000	0.1782	92.9370
100.0000	0.2401	79.2500
100.0000	0.4447	65.5630
100.0000	0.4447	51.8750
100.0000	0.4447	38.1870
100.0000	0.2401	24.5000
100.0000	0.1782	10.8120
100.0000	0.1508	0.0000
100.0000	0.1354	0.0000
100.0000	0.1281	0.0000
100.0000	0.1231	0.0000
100.0000	0.1231	0.0000
100.0000	0.1181	0.0000
100.0000	0.1171	0.0000
100.0000	0.1166	0.0000
100.0000	0.1167	0.0000
100.0000	0.1172	0.0000
100.0000	0.1180	0.0000
100.0000	0.1192	0.0000
100.0000	0.1207	0.0000
100.0000	0.1226	0.0000
100.0000	0.1250	0.0000
100.0000	0.1278	0.0000
100.0000	0.1312	0.0000
100.0000	0.1362	0.0000
100.0000	0.1401	0.0000
100.0000	0.1459	0.0000
100.0000	0.1530	0.0000
100.0000	0.1530	0.0000

--- STOP ---END OF BCAS PROGRAM---



SEMI ACT  
SINGLE #15  
10,5 equivalent  
ATCRBS

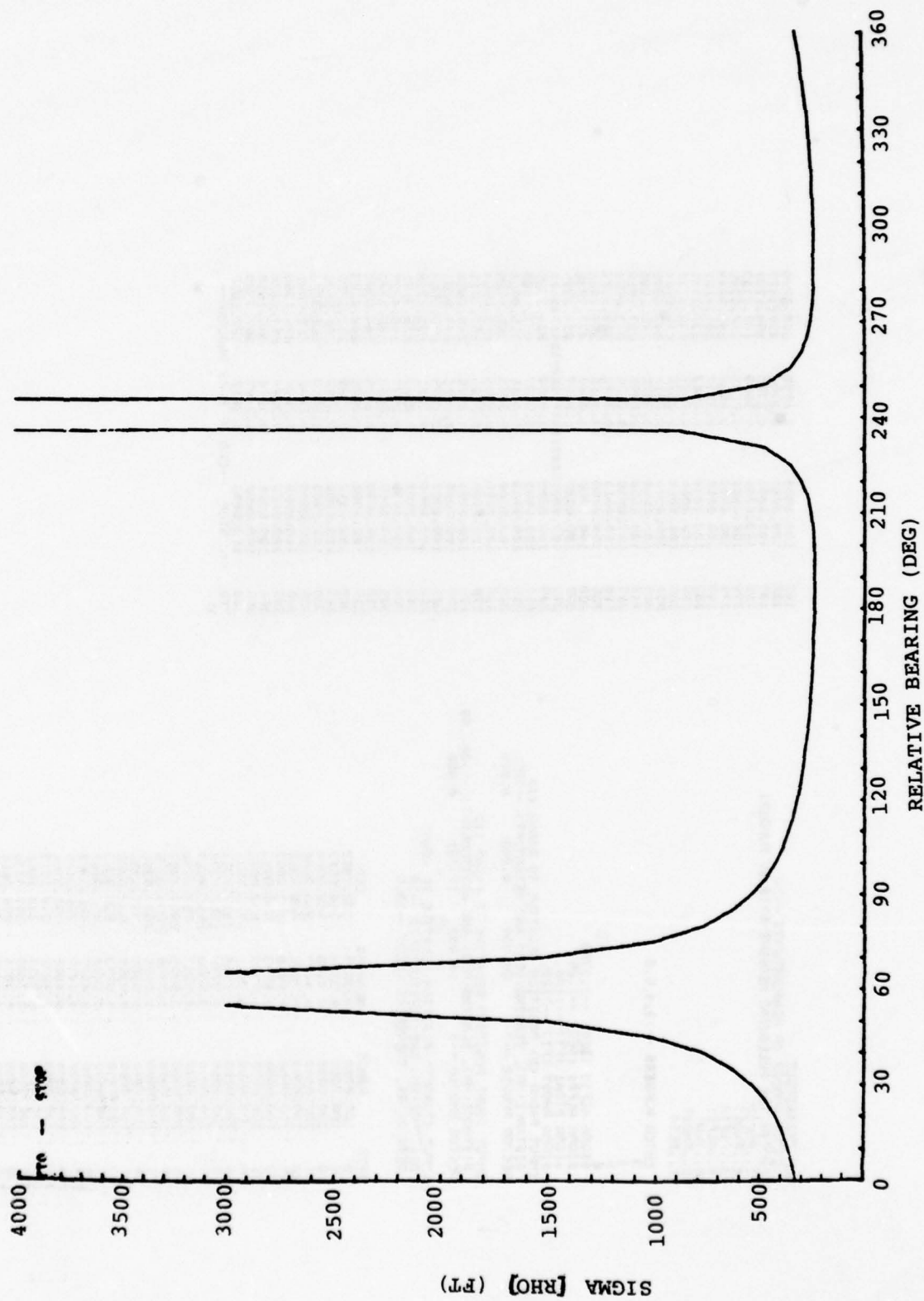








SINGLE # 15  
20.8 EQUIVALENT  
ATCRBS

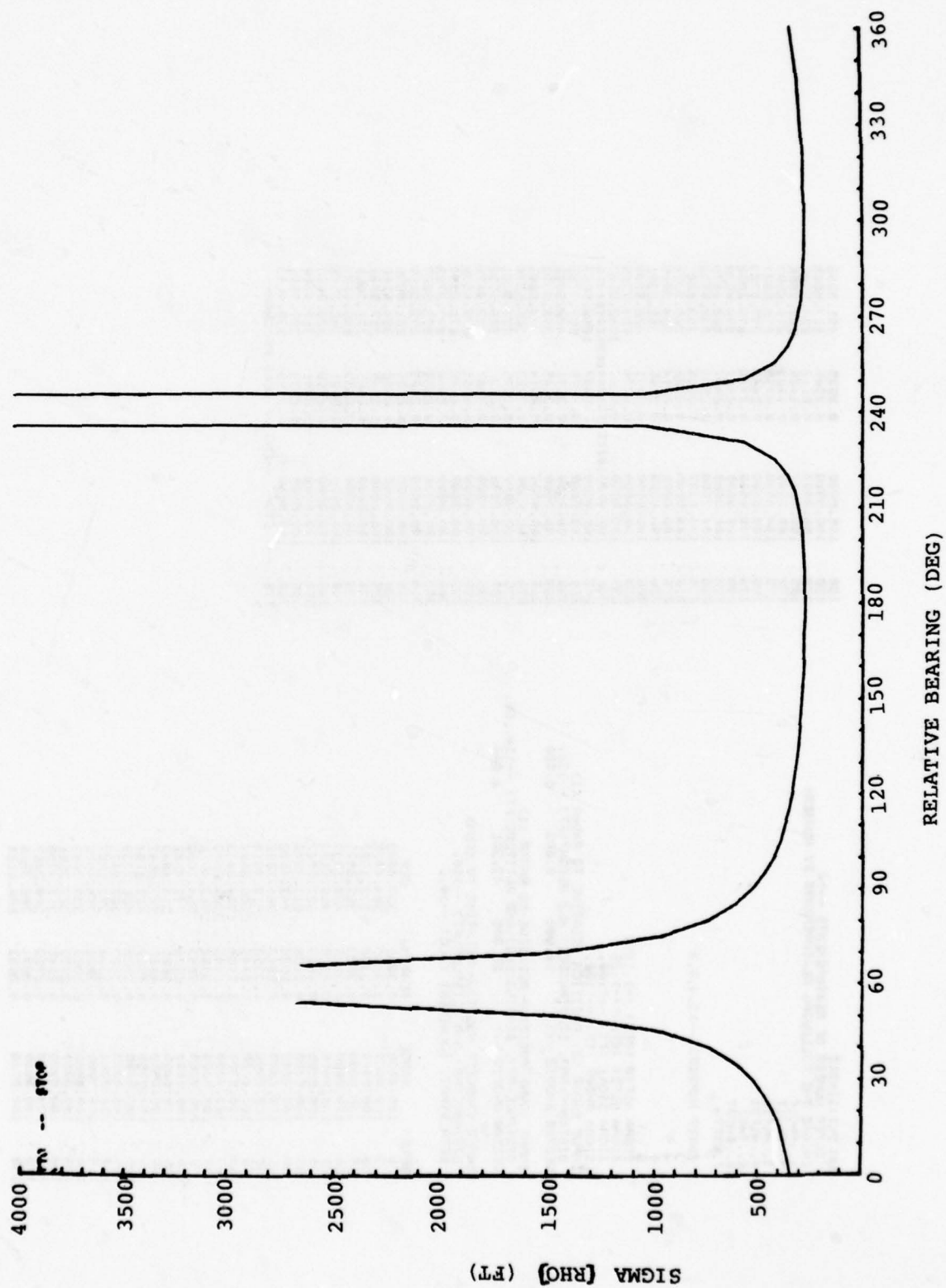








SINGLE #15  
50, 10 equivalent  
ATCRBS





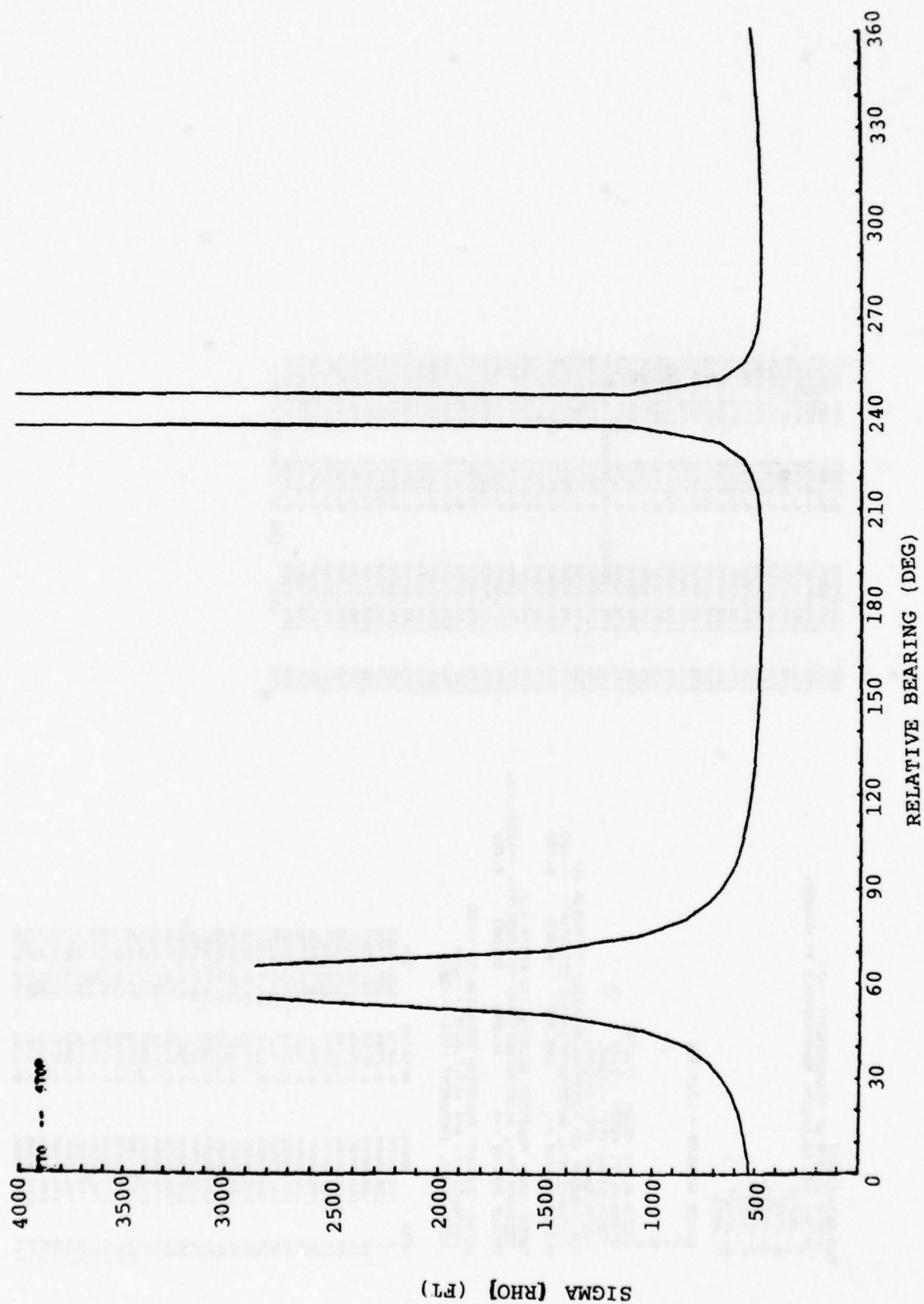
```

RPM INSTRUCTIONS
ENTER NUMBER OF MEASUREMENTS -->4
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO20
3..ALF10
4..ALF20
5..THU1
6..RHO12
7..BETA
ENTER NUMBERS -->3,4,5,6
1
2
3
4
5
6
SIGMA ALF10 (DEG) -->1768
SIGMA ALF20 (DEG) -->25
SIGMA THU1 (FT) -->109
SIGMA THU2 (FT) -->109
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) -->50.
VECTOR RHO12 -->50.000 0.000 0.000
INPUT (AND) POSITION RELATIVE TO RADAR (3)
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->50.60.
VECTOR RHO10 -->43.301 0.000 0.000
INPUT (TARGET) POSITION RELATIVE TO (CAN)
DISTANCE (NM) AND ALTITUDE (FT) -->10.
BETA START, INCREMENT (DEG) -->0.5
BETA RANGE BEARING CEP
0 100.0000 0.3050 339.4643
5 100.0000 0.3206 354.4075
10 100.0000 0.3390 373.1287
15 100.0000 0.3623 397.0071
20 100.0000 0.3925 428.1339
25 100.0000 0.4329 469.8194
30 100.0000 0.4885 527.6047
35 100.0000 0.5688 611.4849
40 100.0000 0.6928 741.4582
45 100.0000 0.9043 964.1686
50 100.0000 1.2352 1419.4610
55 100.0000 2.6445 2846.2609
60 100.0000 5.104 1644.8533
65 100.0000 2.6445 2846.2609
70 100.0000 1.3352 1419.4610
75 100.0000 0.9043 964.1686
80 100.0000 0.6928 741.4582
85 100.0000 0.5688 611.4849
90 100.0000 0.4885 527.6047
95 100.0000 0.4329 469.8194
100 100.0000 0.3925 428.1339
105 100.0000 0.3623 397.0071
110 100.0000 0.3390 373.1287
115 100.0000 0.3206 354.4075
120 100.0000 0.3050 339.4643
125 100.0000 0.2879 327.3581
130 100.0000 0.2759 317.4360
135 100.0000 0.2633 306.5124
140 100.0000 0.2512 294.5146
145 100.0000 0.2446 287.9928
150 100.0000 0.2446 287.9928
155 100.0000 0.2446 287.9928
160 100.0000 0.2446 287.9928
165 100.0000 0.2446 287.9928
170 100.0000 0.2446 287.9928
175 100.0000 0.2446 287.9928
180 100.0000 0.2446 287.9928
185 100.0000 0.2446 287.9928
190 100.0000 0.2446 287.9928
195 100.0000 0.2446 287.9928
200 100.0000 0.2446 287.9928
205 100.0000 0.2446 287.9928
210 100.0000 0.2446 287.9928
215 100.0000 0.2446 287.9928
220 100.0000 0.2446 287.9928
225 100.0000 0.2446 287.9928
230 100.0000 0.2446 287.9928
235 100.0000 0.2446 287.9928
240 100.0000 0.2446 287.9928
245 100.0000 0.2446 287.9928
250 100.0000 0.2446 287.9928
255 100.0000 0.2446 287.9928
260 100.0000 0.2446 287.9928
265 100.0000 0.2446 287.9928
270 100.0000 0.2446 287.9928
275 100.0000 0.2446 287.9928
280 100.0000 0.2446 287.9928
285 100.0000 0.2446 287.9928
290 100.0000 0.2446 287.9928
295 100.0000 0.2446 287.9928
300 100.0000 0.2446 287.9928
305 100.0000 0.2446 287.9928
310 100.0000 0.2446 287.9928
315 100.0000 0.2446 287.9928
320 100.0000 0.2446 287.9928
325 100.0000 0.2446 287.9928
330 100.0000 0.2446 287.9928
335 100.0000 0.2446 287.9928
340 100.0000 0.2446 287.9928
345 100.0000 0.2446 287.9928
350 100.0000 0.2446 287.9928
355 100.0000 0.2446 287.9928
360 100.0000 0.2446 287.9928
365 100.0000 0.2446 287.9928
370 100.0000 0.2446 287.9928
375 100.0000 0.2446 287.9928
380 100.0000 0.2446 287.9928
385 100.0000 0.2446 287.9928
390 100.0000 0.2446 287.9928
395 100.0000 0.2446 287.9928
400 100.0000 0.2446 287.9928
405 100.0000 0.2446 287.9928
410 100.0000 0.2446 287.9928
415 100.0000 0.2446 287.9928
420 100.0000 0.2446 287.9928
425 100.0000 0.2446 287.9928
430 100.0000 0.2446 287.9928
435 100.0000 0.2446 287.9928
440 100.0000 0.2446 287.9928
445 100.0000 0.2446 287.9928
450 100.0000 0.2446 287.9928
455 100.0000 0.2446 287.9928
460 100.0000 0.2446 287.9928
465 100.0000 0.2446 287.9928
470 100.0000 0.2446 287.9928
475 100.0000 0.2446 287.9928
480 100.0000 0.2446 287.9928
485 100.0000 0.2446 287.9928
490 100.0000 0.2446 287.9928
495 100.0000 0.2446 287.9928
500 100.0000 0.2446 287.9928
505 100.0000 0.2446 287.9928
510 100.0000 0.2446 287.9928
515 100.0000 0.2446 287.9928
520 100.0000 0.2446 287.9928
525 100.0000 0.2446 287.9928
530 100.0000 0.2446 287.9928
535 100.0000 0.2446 287.9928
540 100.0000 0.2446 287.9928
545 100.0000 0.2446 287.9928
550 100.0000 0.2446 287.9928
555 100.0000 0.2446 287.9928
560 100.0000 0.2446 287.9928
565 100.0000 0.2446 287.9928
570 100.0000 0.2446 287.9928
575 100.0000 0.2446 287.9928
580 100.0000 0.2446 287.9928
585 100.0000 0.2446 287.9928
590 100.0000 0.2446 287.9928
595 100.0000 0.2446 287.9928
600 100.0000 0.2446 287.9928
605 100.0000 0.2446 287.9928
610 100.0000 0.2446 287.9928
615 100.0000 0.2446 287.9928
620 100.0000 0.2446 287.9928
625 100.0000 0.2446 287.9928
630 100.0000 0.2446 287.9928
635 100.0000 0.2446 287.9928
640 100.0000 0.2446 287.9928
645 100.0000 0.2446 287.9928
650 100.0000 0.2446 287.9928
655 100.0000 0.2446 287.9928
660 100.0000 0.2446 287.9928
665 100.0000 0.2446 287.9928
670 100.0000 0.2446 287.9928
675 100.0000 0.2446 287.9928
680 100.0000 0.2446 287.9928
685 100.0000 0.2446 287.9928
690 100.0000 0.2446 287.9928
695 100.0000 0.2446 287.9928
700 100.0000 0.2446 287.9928
705 100.0000 0.2446 287.9928
710 100.0000 0.2446 287.9928
715 100.0000 0.2446 287.9928
720 100.0000 0.2446 287.9928
725 100.0000 0.2446 287.9928
730 100.0000 0.2446 287.9928
735 100.0000 0.2446 287.9928
740 100.0000 0.2446 287.9928
745 100.0000 0.2446 287.9928
750 100.0000 0.2446 287.9928
755 100.0000 0.2446 287.9928
760 100.0000 0.2446 287.9928
765 100.0000 0.2446 287.9928
770 100.0000 0.2446 287.9928
775 100.0000 0.2446 287.9928
780 100.0000 0.2446 287.9928
785 100.0000 0.2446 287.9928
790 100.0000 0.2446 287.9928
795 100.0000 0.2446 287.9928
800 100.0000 0.2446 287.9928
805 100.0000 0.2446 287.9928
810 100.0000 0.2446 287.9928
815 100.0000 0.2446 287.9928
820 100.0000 0.2446 287.9928
825 100.0000 0.2446 287.9928
830 100.0000 0.2446 287.9928
835 100.0000 0.2446 287.9928
840 100.0000 0.2446 287.9928
845 100.0000 0.2446 287.9928
850 100.0000 0.2446 287.9928
855 100.0000 0.2446 287.9928
860 100.0000 0.2446 287.9928
865 100.0000 0.2446 287.9928
870 100.0000 0.2446 287.9928
875 100.0000 0.2446 287.9928
880 100.0000 0.2446 287.9928
885 100.0000 0.2446 287.9928
890 100.0000 0.2446 287.9928
895 100.0000 0.2446 287.9928
900 100.0000 0.2446 287.9928
905 100.0000 0.2446 287.9928
910 100.0000 0.2446 287.9928
915 100.0000 0.2446 287.9928
920 100.0000 0.2446 287.9928
925 100.0000 0.2446 287.9928
930 100.0000 0.2446 287.9928
935 100.0000 0.2446 287.9928
940 100.0000 0.2446 287.9928
945 100.0000 0.2446 287.9928
950 100.0000 0.2446 287.9928
955 100.0000 0.2446 287.9928
960 100.0000 0.2446 287.9928
965 100.0000 0.2446 287.9928
970 100.0000 0.2446 287.9928
975 100.0000 0.2446 287.9928
980 100.0000 0.2446 287.9928
985 100.0000 0.2446 287.9928
990 100.0000 0.2446 287.9928
995 100.0000 0.2446 287.9928
1000 100.0000 0.2446 287.9928

```



SINGLE #15  
100,20 equilet  
ATCRBS

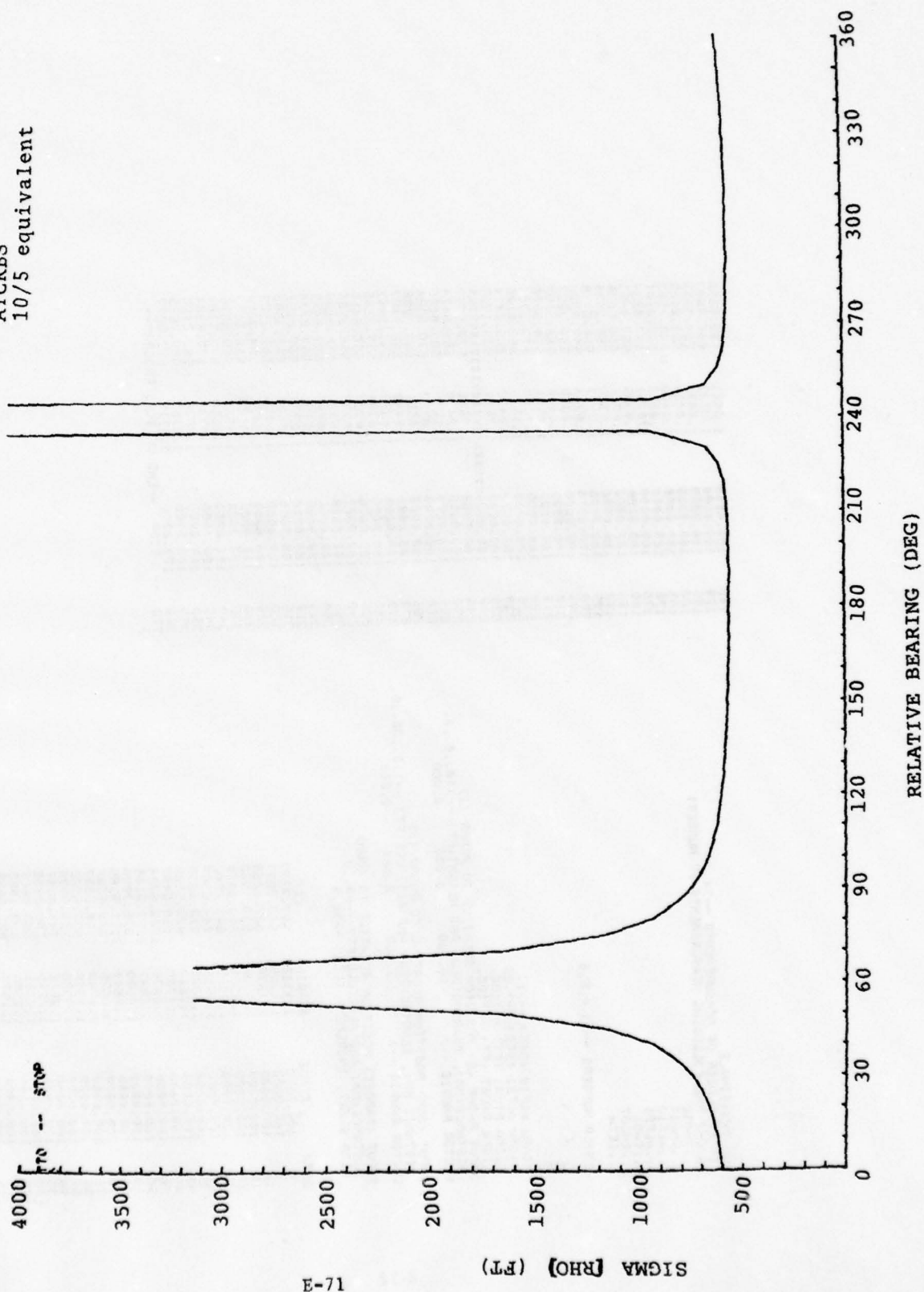








SINGLE #15  
 with Directional Antenna  
 with 10 error  
 ATCRBS  
 10/5 equivalent

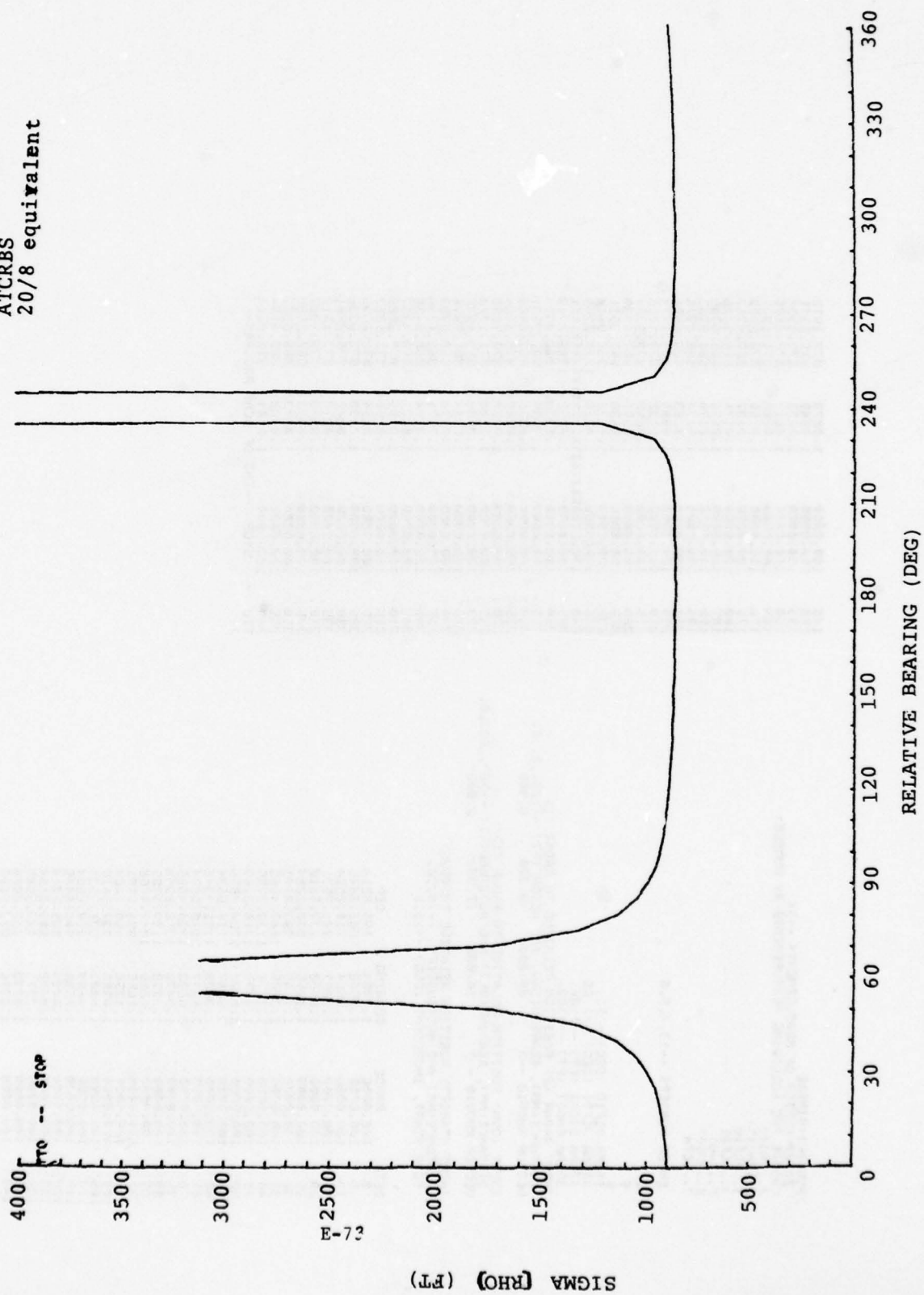








SINGLE #15  
with Directional Antenna  
With 10 error  
ATCRBS  
20/8 equivalent

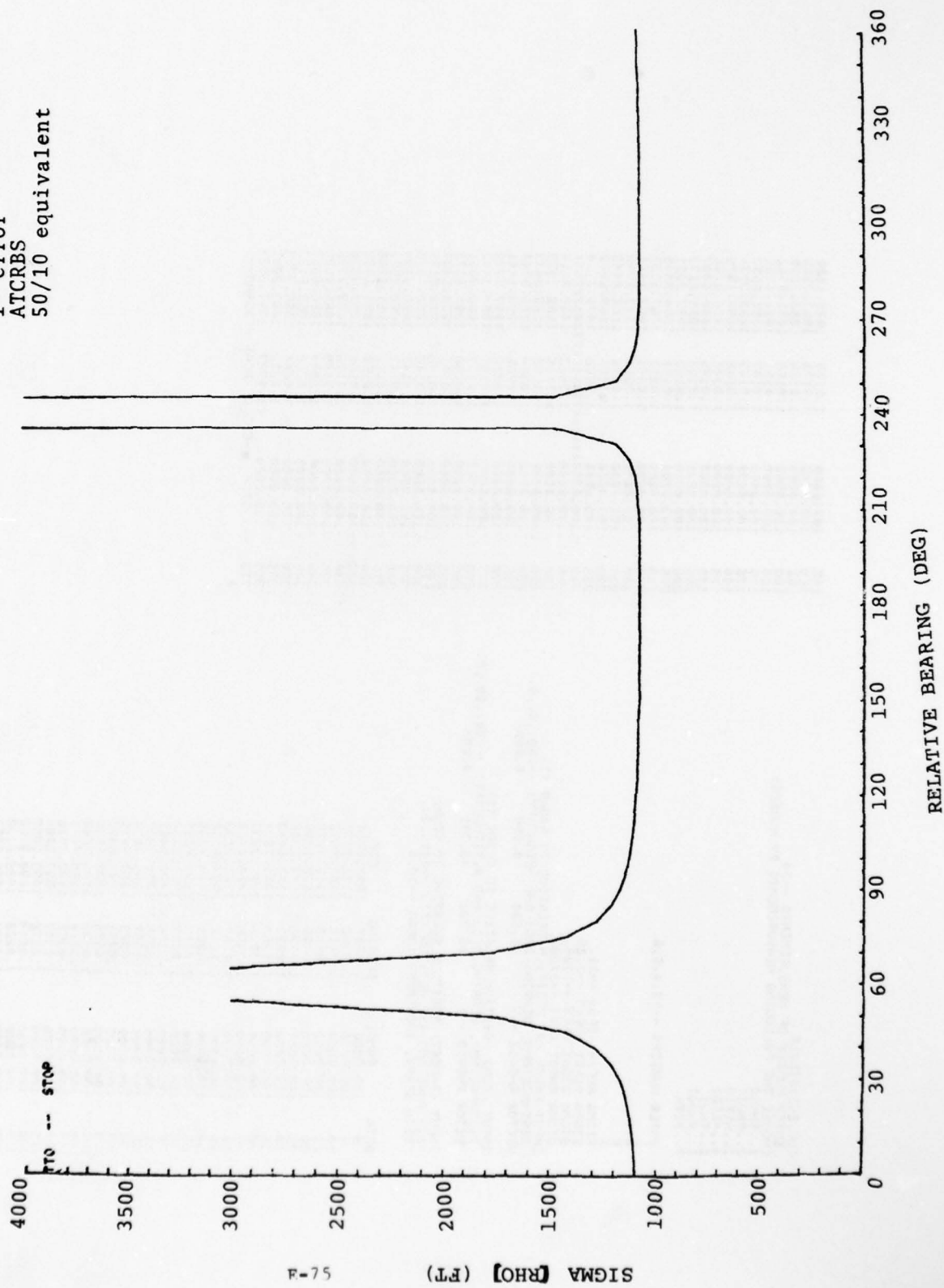








SINGLE #15  
with Directional Antenna with  
1° error  
ATCRBS  
50/10 equivalent

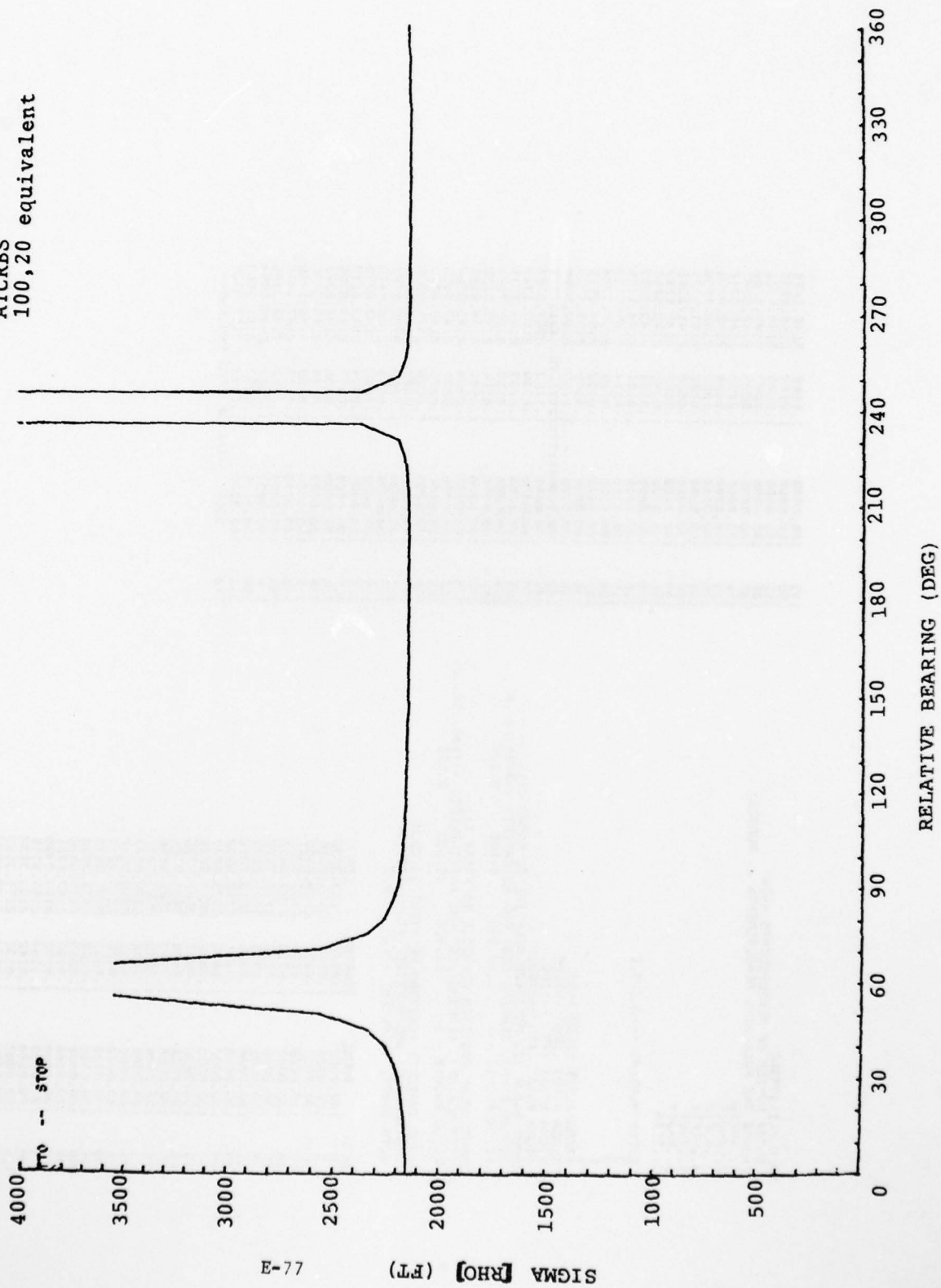








SINGLE #15  
with Directional Antenna  
with 1° error  
ATCRBS  
100,20 equivalent

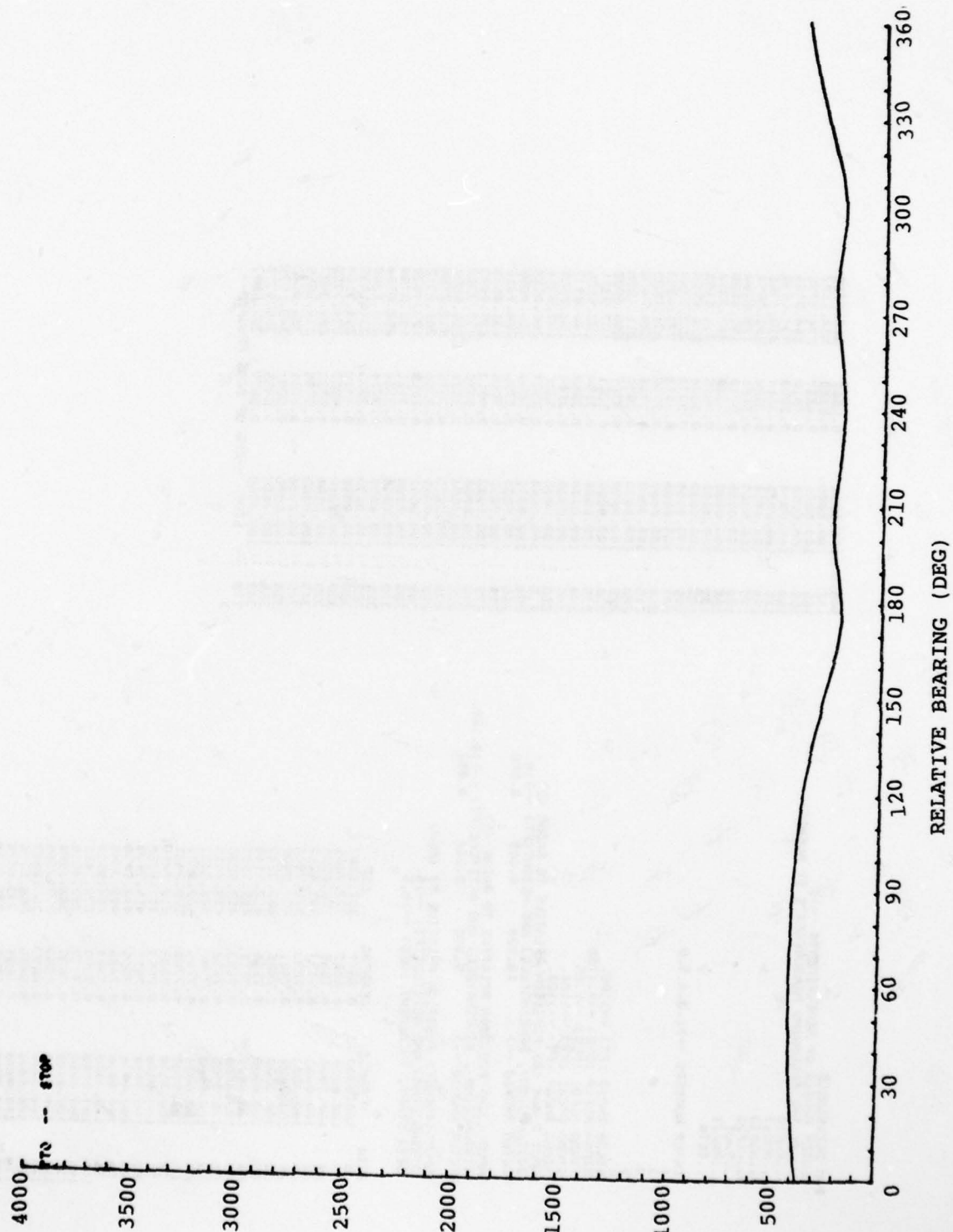








Semi-Act  
SINGLE #20  
10.5 equivalent  
ATCRBS





```

RUN IN: SINGLE
ENTER NUMBER OF MEASUREMENTS --> 5
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RANG
2..BEAR
3..ALF10
4..ALF01
5..TRAIL
6..RNGAT
7..BETA

ENTER NUMBERS --> 1,3,4,5,6
1
3
4
5
6
SIGMA RHO10 (FT) --> 100.
SIGMA ALF10 (DEG) --> 1.768
SIGMA ALF01 (DEG) --> .25
SIGMA DT01 (FT) --> 100.
SIGMA RHO01 (FT) --> 100.
INPUT RADAR <2> POSITION RELATIVE TO RADAR <1>
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) --> 10.
VECTOR RHO012 --> 10.000 0.000 0.000

INPUT <OWN> POSITION RELATIVE TO RADAR <1>
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) --> 10.00.
VECTOR RHO010 --> 5.000 9.000 0.000

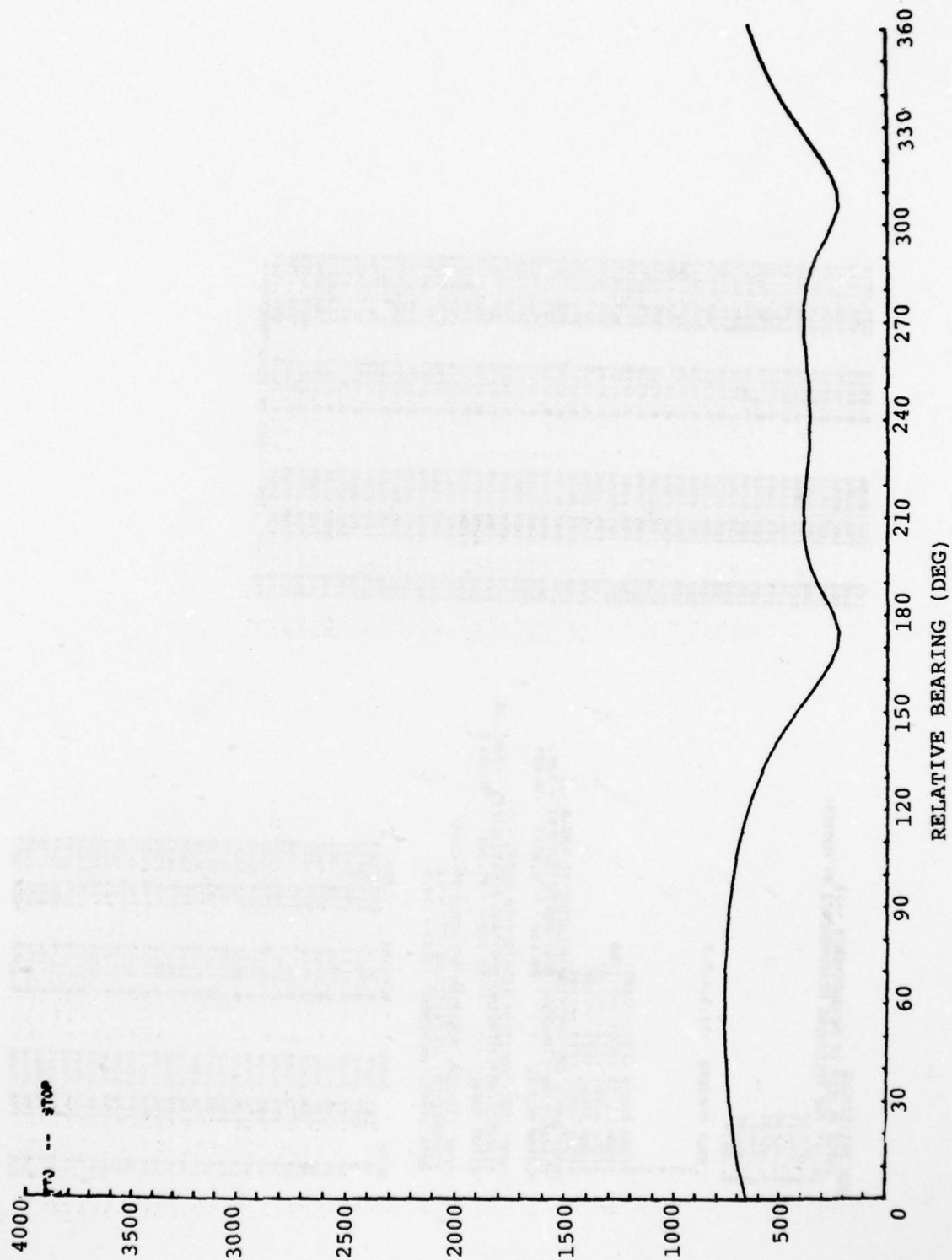
INPUT <TARGET> POSITION RELATIVE TO <OWN>
DISTANCE (NM) AND ALTITUDE (FT) --> 5.
BETA START, INCREMENT (DEG) --> 0.5.

BETA RANGE BEARING CEP
0 100.0000 0.6677 367.8807
5 100.0000 0.6869 377.7065
10 100.0000 0.7035 386.1900
15 100.0000 0.7177 393.4910
20 100.0000 0.7290 399.7086
25 100.0000 0.7401 404.9590
30 100.0000 0.7486 409.3349
35 100.0000 0.7555 412.9140
40 100.0000 0.7611 415.7599
45 100.0000 0.7653 417.9230
50 100.0000 0.7682 419.4415
55 100.0000 0.7700 420.3421
60 100.0000 0.7706 420.6405
65 100.0000 0.7700 420.3421
70 100.0000 0.7682 419.4415
75 100.0000 0.7653 417.9230
80 100.0000 0.7611 415.7599
85 100.0000 0.7555 412.9140
90 100.0000 0.7486 409.3349
95 100.0000 0.7401 404.9590
100 100.0000 0.7290 399.7086
105 100.0000 0.7177 393.4910
110 100.0000 0.7035 386.1900
115 100.0000 0.6869 377.7065
120 100.0000 0.6677 367.8807
125 100.0000 0.6455 356.2776
130 100.0000 0.6201 343.5778
135 100.0000 0.5911 329.0060
140 100.0000 0.5585 312.5659
145 100.0000 0.5222 294.3087
150 100.0000 0.4827 274.7759
155 100.0000 0.4410 254.3164
160 100.0000 0.3903 234.1836
165 100.0000 0.3614 216.1368
170 100.0000 0.3324 202.0650
175 100.0000 0.3101 190.0794
180 100.0000 0.3210 197.4829
185 100.0000 0.3380 206.2312
190 100.0000 0.3616 216.2108
195 100.0000 0.3834 226.5624
200 100.0000 0.3976 233.3004
205 100.0000 0.4012 238.0932
210 100.0000 0.3946 241.7026
215 100.0000 0.3786 245.4906
220 100.0000 0.3600 248.0820
225 100.0000 0.3397 249.0820
230 100.0000 0.3221 249.0211
235 100.0000 0.3104 248.6877
240 100.0000 0.2982 248.0595
245 100.0000 0.2854 247.1311
250 100.0000 0.2721 245.9311
255 100.0000 0.2587 244.4629
260 100.0000 0.2450 242.7590
265 100.0000 0.2306 240.7516
270 100.0000 0.2145 238.4828
275 100.0000 0.1973 235.9743
280 100.0000 0.1796 233.2584
285 100.0000 0.1615 229.3594
290 100.0000 0.1430 225.2158
295 100.0000 0.1240 220.8729
300 100.0000 0.1041 216.3794
305 100.0000 0.0834 211.7820
310 100.0000 0.0614 207.1305
315 100.0000 0.0393 202.4625
320 100.0000 0.0169 197.8184
325 100.0000 0.0027 193.2159
330 100.0000 0.0000 188.6887
335 100.0000 0.0000 184.2387
340 100.0000 0.0000 179.8659
345 100.0000 0.0000 175.5680
350 100.0000 0.0000 171.3457
355 100.0000 0.0000 167.1976
360 100.0000 0.0000 163.1240
365 100.0000 0.0000 159.1240
370 100.0000 0.0000 155.1976
375 100.0000 0.0000 151.3457
380 100.0000 0.0000 147.5680
385 100.0000 0.0000 143.8659
390 100.0000 0.0000 140.2387
395 100.0000 0.0000 136.6887
400 100.0000 0.0000 133.2159
405 100.0000 0.0000 129.8184
410 100.0000 0.0000 126.4625
415 100.0000 0.0000 123.1305
420 100.0000 0.0000 119.8184
425 100.0000 0.0000 116.5184
430 100.0000 0.0000 113.2384
435 100.0000 0.0000 109.9743
440 100.0000 0.0000 106.7243
445 100.0000 0.0000 103.4884
450 100.0000 0.0000 100.2625
455 100.0000 0.0000 97.0466
460 100.0000 0.0000 93.8407
465 100.0000 0.0000 90.6448
470 100.0000 0.0000 87.4589
475 100.0000 0.0000 84.2830
480 100.0000 0.0000 81.1171
485 100.0000 0.0000 77.9712
490 100.0000 0.0000 74.8453
495 100.0000 0.0000 71.7294
500 100.0000 0.0000 68.6235
505 100.0000 0.0000 65.5276
510 100.0000 0.0000 62.4417
515 100.0000 0.0000 59.3658
520 100.0000 0.0000 56.2999
525 100.0000 0.0000 53.2440
530 100.0000 0.0000 50.1981
535 100.0000 0.0000 47.1622
540 100.0000 0.0000 44.1363
545 100.0000 0.0000 41.1204
550 100.0000 0.0000 38.1145
555 100.0000 0.0000 35.1186
560 100.0000 0.0000 32.1327
565 100.0000 0.0000 29.1568
570 100.0000 0.0000 26.1909
575 100.0000 0.0000 23.2350
580 100.0000 0.0000 20.2891
585 100.0000 0.0000 17.3532
590 100.0000 0.0000 14.4273
595 100.0000 0.0000 11.5014
600 100.0000 0.0000 8.5855
605 100.0000 0.0000 5.6696
610 100.0000 0.0000 2.7537
615 100.0000 0.0000 0.0000
620 100.0000 0.0000 0.0000
625 100.0000 0.0000 0.0000
630 100.0000 0.0000 0.0000
635 100.0000 0.0000 0.0000
640 100.0000 0.0000 0.0000
645 100.0000 0.0000 0.0000
650 100.0000 0.0000 0.0000
655 100.0000 0.0000 0.0000
660 100.0000 0.0000 0.0000
665 100.0000 0.0000 0.0000
670 100.0000 0.0000 0.0000
675 100.0000 0.0000 0.0000
680 100.0000 0.0000 0.0000
685 100.0000 0.0000 0.0000
690 100.0000 0.0000 0.0000
695 100.0000 0.0000 0.0000
700 100.0000 0.0000 0.0000
705 100.0000 0.0000 0.0000
710 100.0000 0.0000 0.0000
715 100.0000 0.0000 0.0000
720 100.0000 0.0000 0.0000
725 100.0000 0.0000 0.0000
730 100.0000 0.0000 0.0000
735 100.0000 0.0000 0.0000
740 100.0000 0.0000 0.0000
745 100.0000 0.0000 0.0000
750 100.0000 0.0000 0.0000
755 100.0000 0.0000 0.0000
760 100.0000 0.0000 0.0000
765 100.0000 0.0000 0.0000
770 100.0000 0.0000 0.0000
775 100.0000 0.0000 0.0000
780 100.0000 0.0000 0.0000
785 100.0000 0.0000 0.0000
790 100.0000 0.0000 0.0000
795 100.0000 0.0000 0.0000
800 100.0000 0.0000 0.0000
805 100.0000 0.0000 0.0000
810 100.0000 0.0000 0.0000
815 100.0000 0.0000 0.0000
820 100.0000 0.0000 0.0000
825 100.0000 0.0000 0.0000
830 100.0000 0.0000 0.0000
835 100.0000 0.0000 0.0000
840 100.0000 0.0000 0.0000
845 100.0000 0.0000 0.0000
850 100.0000 0.0000 0.0000
855 100.0000 0.0000 0.0000
860 100.0000 0.0000 0.0000
865 100.0000 0.0000 0.0000
870 100.0000 0.0000 0.0000
875 100.0000 0.0000 0.0000
880 100.0000 0.0000 0.0000
885 100.0000 0.0000 0.0000
890 100.0000 0.0000 0.0000
895 100.0000 0.0000 0.0000
900 100.0000 0.0000 0.0000
905 100.0000 0.0000 0.0000
910 100.0000 0.0000 0.0000
915 100.0000 0.0000 0.0000
920 100.0000 0.0000 0.0000
925 100.0000 0.0000 0.0000
930 100.0000 0.0000 0.0000
935 100.0000 0.0000 0.0000
940 100.0000 0.0000 0.0000
945 100.0000 0.0000 0.0000
950 100.0000 0.0000 0.0000
955 100.0000 0.0000 0.0000
960 100.0000 0.0000 0.0000
965 100.0000 0.0000 0.0000
970 100.0000 0.0000 0.0000
975 100.0000 0.0000 0.0000
980 100.0000 0.0000 0.0000
985 100.0000 0.0000 0.0000
990 100.0000 0.0000 0.0000
995 100.0000 0.0000 0.0000
1000 100.0000 0.0000 0.0000

```



SINGLE #20  
20,8 equivalent  
ATCRBS





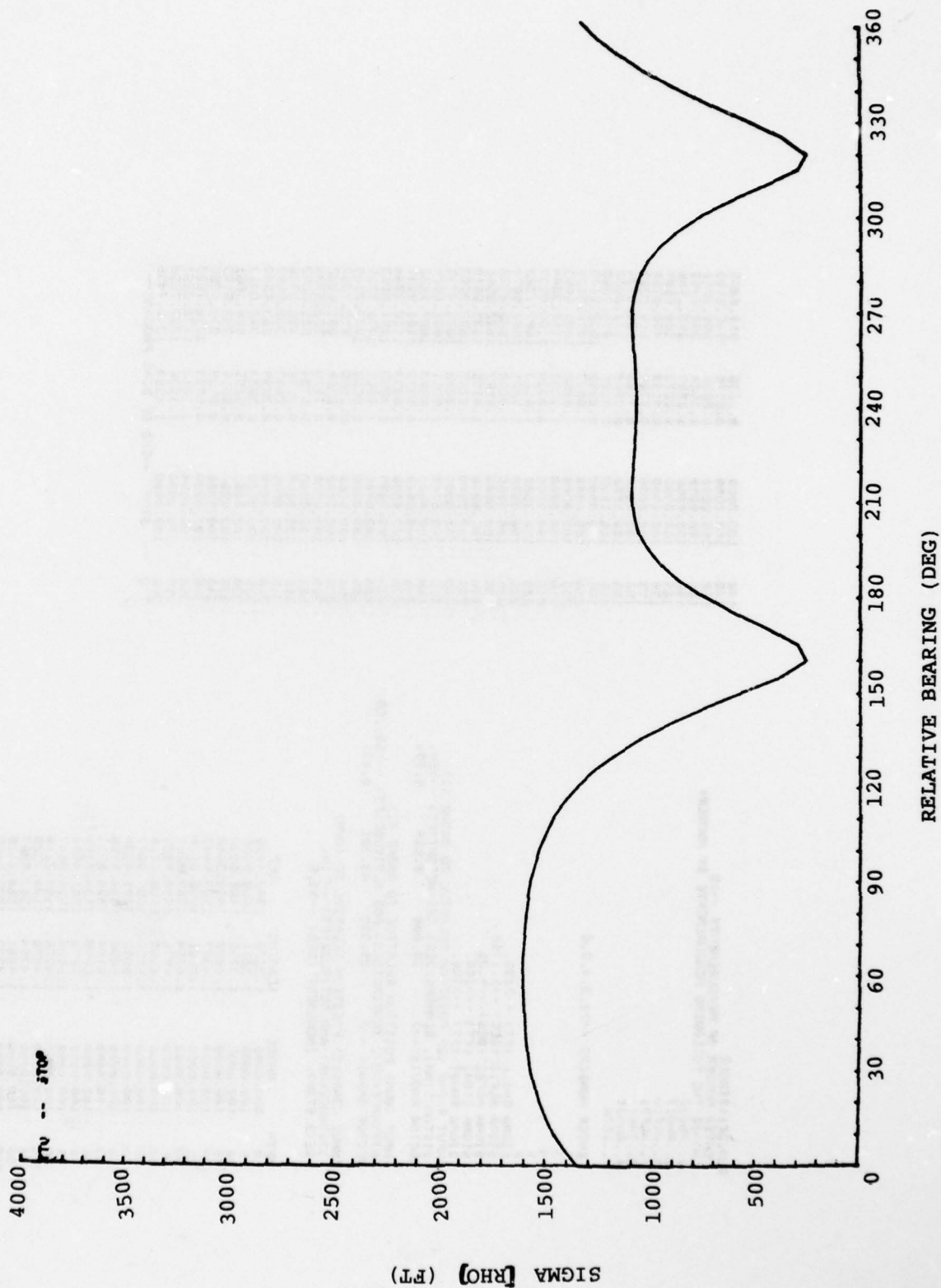
```

RUN IN SINGLE
ENTER NUMBER OF MEASUREMENTS -->5
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO11
3..RHO12
4..ALF10
5..ALF11
6..ALF12
7..THU1
8..THU2
9..BETH
ENTER NUMBERS -->1,3,4,5,6
1
3
4
5
6
SIGMA RHO10 (FT) -->100.
SIGMA ALF10 (DEG) -->1.768
SIGMA ALF11 (DEG) -->.25
SIGMA ALF12 (DEG) -->.25
SIGMA THU1 (FT) -->100.
SIGMA THU2 (FT) -->100.
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) -->20.
VECTOR RHO12 --> 20.000 0.000 0.000
INPUT (COUNT) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->20.00.
VECTOR RHO10 --> 10.000 17.321 0.000
INPUT (TARGET) POSITION RELATIVE TO (COUNT)
DISTANCE (NM) AND ALTITUDE (FT) -->8.
BETA START, INCREMENT (DEG) -->0.5
BETA RANGE BEARING CEP
0 100.0000 0.7639 655.7624
5 100.0000 0.7897 677.3733
10 100.0000 0.8113 695.5497
15 100.0000 0.8295 710.7699
20 100.0000 0.8445 723.4461
25 100.0000 0.8570 733.9258
30 100.0000 0.8672 742.4965
35 100.0000 0.8754 749.3923
40 100.0000 0.8818 754.7999
45 100.0000 0.8867 758.8643
50 100.0000 0.8900 761.6934
55 100.0000 0.8920 763.3618
60 100.0000 0.8927 763.9132
65 100.0000 0.8920 763.3618
70 100.0000 0.8900 761.6934
75 100.0000 0.8867 758.8643
80 100.0000 0.8818 754.7999
85 100.0000 0.8754 749.3923
90 100.0000 0.8672 742.4965
95 100.0000 0.8570 733.9258
100 100.0000 0.8445 723.4461
105 100.0000 0.8295 710.7699
110 100.0000 0.8113 695.5497
115 100.0000 0.7897 677.3733
120 100.0000 0.7639 655.7624
125 100.0000 0.7334 630.1735
130 100.0000 0.6974 600.0489
135 100.0000 0.6552 564.8067

```



SINGLE #20  
50,10 equivalent  
ATCRBS



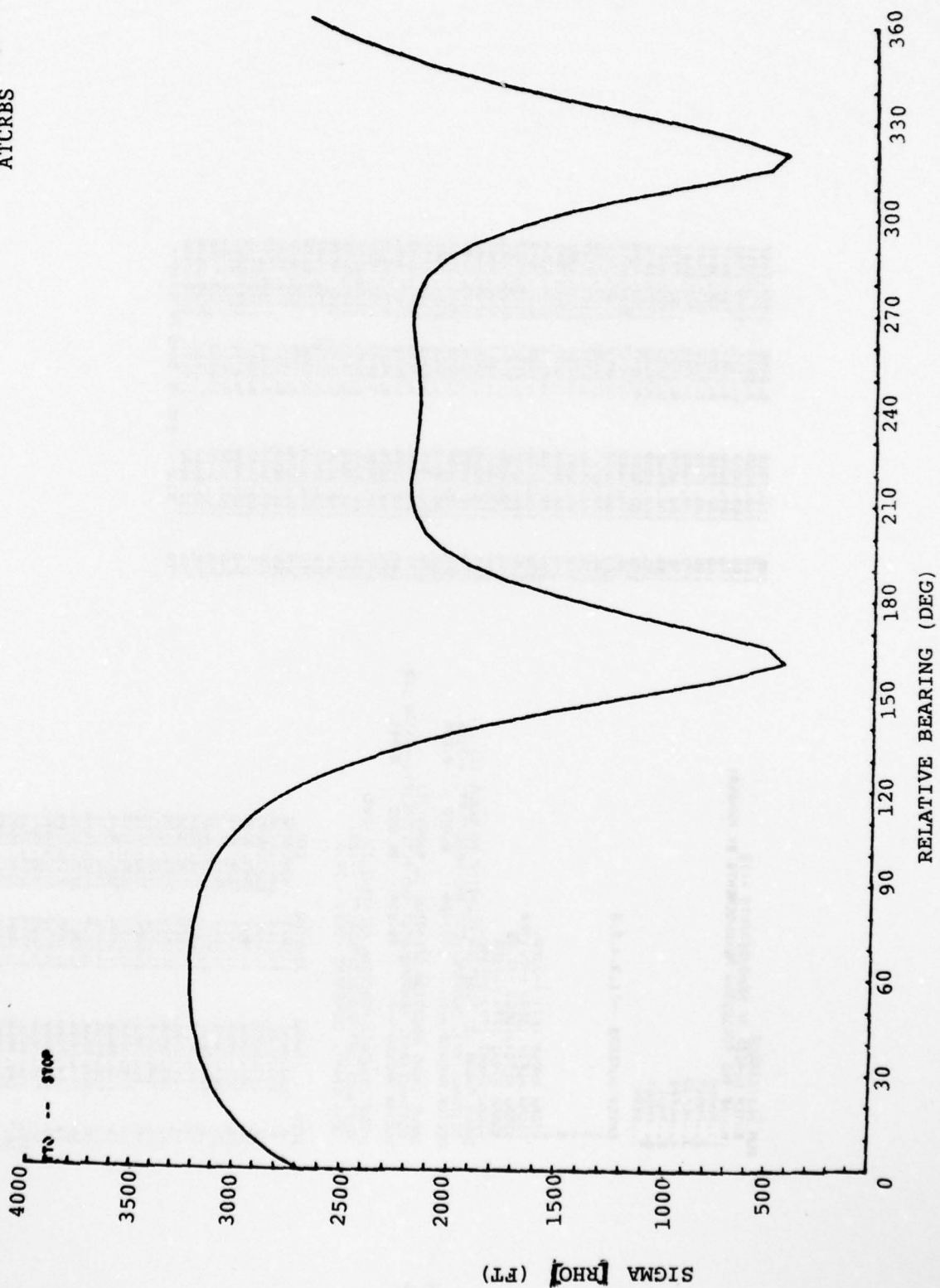


```

PUN BK1: SINGLE
ENTER NUMBER OF MEASUREMENTS --> 5
CM-->E THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO11
3..ALF10
4..ALF11
5..RHO12
6..RHO13
7..BETA
ENTER NUMBERS --> 1,3,4,5,6
1
2
3
4
5
6
SIGNA RHO10 (FT) --> 100.
SIGNA ALF1 (DEG) --> 1768
SIGNA ALF2 (DEG) --> 25
SIGNA RHO11 (FT) --> 100.
SIGNA RHO12 (FT) --> 100.
SIGNA RHO13 (FT) --> 100.
INPUT RADAR (2) POSITION RELATIVE TO RADAR (<1>)
DISTANCE(M), BEARING(DEG) AND HEIGHT(FT) --> 50.
VECTOR RHO12 --> 50.000 0.000 0.000
INPUT (COUNT) POSITION RELATIVE TO RADAR (<1>)
DISTANCE(M), BEARING(DEG) AND ALTITUDE(FT) --> 50.50.
VECTOR RHO11 --> 25.000 43.301 0.000
INPUT (START) POSITION RELATIVE TO (COUNT)
DISTANCE(M) AND ALTITUDE(FT) --> 310.
BETA START, INCREMENT (DEG) --> 0.5
BETA RANGE BEARING CEP
0 100.0000 1.2680 1348.4435
5 100.0000 1.3276 1416.9566
10 100.0000 1.3736 1460.6899
15 100.0000 1.4098 1498.3642
20 100.0000 1.4377 1527.9469
25 100.0000 1.4591 1550.6150
30 100.0000 1.4754 1567.8267
35 100.0000 1.4876 1580.7329
40 100.0000 1.4966 1590.2210
45 100.0000 1.5020 1596.9647
50 100.0000 1.5072 1601.4534
55 100.0000 1.5096 1604.0190
60 100.0000 1.5104 1604.8533
65 100.0000 1.5095 1604.0190
70 100.0000 1.5072 1601.4534
75 100.0000 1.5020 1596.9647
80 100.0000 1.4966 1590.2210
85 100.0000 1.4876 1580.7329
90 100.0000 1.4754 1567.8267
95 100.0000 1.4591 1550.6150
00 100.0000 1.4377 1527.9469
05 100.0000 1.4098 1498.3642
10 100.0000 1.3736 1460.6899
15 100.0000 1.3271 1410.9566
20 100.0000 1.2680 1348.4435
25 100.0000 1.1936 1269.7552
30 100.0000 1.1012 1172.0751
35 100.0000 0.9883 1062.7889
149 100.0000 0.8535 910.6889
148 100.0000 0.8078 748.5195
147 100.0000 0.8585 568.1061
146 100.0000 0.9244 388.8451
145 100.0000 0.9280 200.5507
144 100.0000 0.8873 48.0786
143 100.0000 0.5724 6.5263
142 100.0000 0.7129 768.5734
141 100.0000 0.8560 881.6822
140 100.0000 0.9105 970.7359
139 100.0000 0.9688 1070.7885
138 100.0000 1.0052 1091.8053
137 100.0000 1.0233 1100.9044
136 100.0000 1.0230 1100.9037
135 100.0000 1.0203 1097.1822
134 100.0000 1.0251 1091.6874
133 100.0000 1.0202 1086.4738
132 100.0000 1.0167 1082.9502
131 100.0000 1.0155 1081.5619
130 100.0000 1.0167 1082.9502
129 100.0000 1.0202 1086.4738
128 100.0000 1.0251 1091.6874
127 100.0000 1.0303 1097.1822
126 100.0000 1.0230 1100.9037
125 100.0000 1.0233 1100.9044
124 100.0000 1.0252 1091.8053
123 100.0000 1.0233 1100.9037
122 100.0000 1.0203 1097.1822
121 100.0000 1.0251 1091.6874
120 100.0000 1.0202 1086.4738
119 100.0000 1.0167 1082.9502
118 100.0000 1.0155 1081.5619
117 100.0000 1.0167 1082.9502
116 100.0000 1.0202 1086.4738
115 100.0000 1.0251 1091.6874
114 100.0000 1.0303 1097.1822
113 100.0000 1.0230 1100.9037
112 100.0000 1.0233 1100.9044
111 100.0000 1.0252 1091.8053
110 100.0000 1.0233 1100.9037
109 100.0000 1.0203 1097.1822
108 100.0000 1.0251 1091.6874
107 100.0000 1.0202 1086.4738
106 100.0000 1.0167 1082.9502
105 100.0000 1.0155 1081.5619
104 100.0000 1.0167 1082.9502
103 100.0000 1.0202 1086.4738
102 100.0000 1.0251 1091.6874
101 100.0000 1.0303 1097.1822
100 100.0000 1.0230 1100.9037
99 100.0000 1.0233 1100.9044
98 100.0000 1.0252 1091.8053
97 100.0000 1.0233 1100.9037
96 100.0000 1.0203 1097.1822
95 100.0000 1.0251 1091.6874
94 100.0000 1.0202 1086.4738
93 100.0000 1.0167 1082.9502
92 100.0000 1.0155 1081.5619
91 100.0000 1.0167 1082.9502
90 100.0000 1.0202 1086.4738
89 100.0000 1.0251 1091.6874
88 100.0000 1.0303 1097.1822
87 100.0000 1.0230 1100.9037
86 100.0000 1.0233 1100.9044
85 100.0000 1.0252 1091.8053
84 100.0000 1.0233 1100.9037
83 100.0000 1.0203 1097.1822
82 100.0000 1.0251 1091.6874
81 100.0000 1.0202 1086.4738
80 100.0000 1.0167 1082.9502
79 100.0000 1.0155 1081.5619
78 100.0000 1.0167 1082.9502
77 100.0000 1.0202 1086.4738
76 100.0000 1.0251 1091.6874
75 100.0000 1.0303 1097.1822
74 100.0000 1.0230 1100.9037
73 100.0000 1.0233 1100.9044
72 100.0000 1.0252 1091.8053
71 100.0000 1.0233 1100.9037
70 100.0000 1.0203 1097.1822
69 100.0000 1.0251 1091.6874
68 100.0000 1.0202 1086.4738
67 100.0000 1.0167 1082.9502
66 100.0000 1.0155 1081.5619
65 100.0000 1.0167 1082.9502
64 100.0000 1.0202 1086.4738
63 100.0000 1.0251 1091.6874
62 100.0000 1.0303 1097.1822
61 100.0000 1.0230 1100.9037
60 100.0000 1.0233 1100.9044
59 100.0000 1.0252 1091.8053
58 100.0000 1.0233 1100.9037
57 100.0000 1.0203 1097.1822
56 100.0000 1.0251 1091.6874
55 100.0000 1.0202 1086.4738
54 100.0000 1.0167 1082.9502
53 100.0000 1.0155 1081.5619
52 
```



SINGLE #20  
100.20 equivalent  
ATCRBS

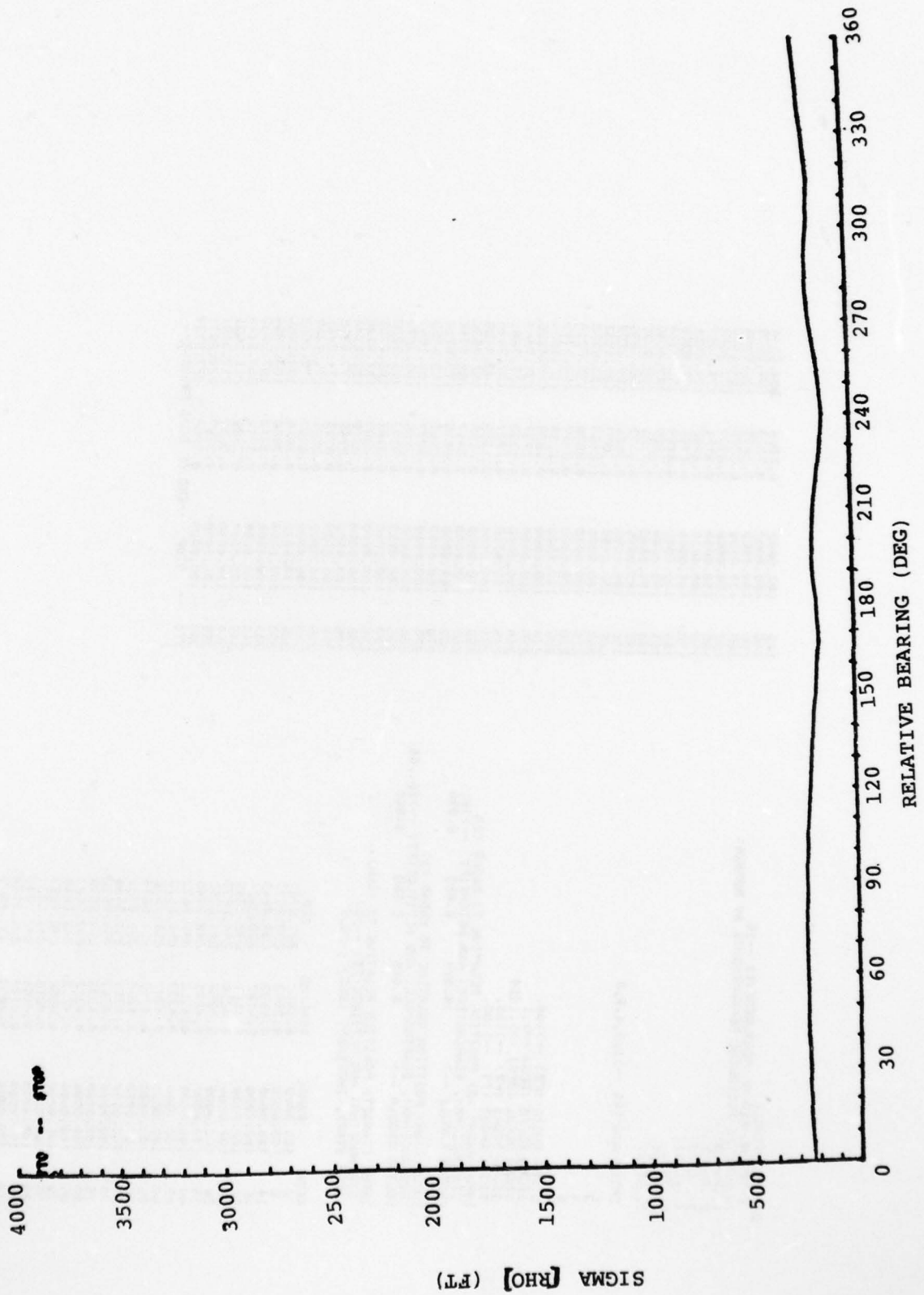








SEMI-ACT  
SINGLE #20  
10.5 equivalent  
DABS





```

RUN BK1: SINGLE
ENTER NUMBER OF MEASUREMENTS --> 5
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..ALPH1
3..ALPH10
4..ALPH10
5..TAU1
6..RHO10
7..BETA
ENTER NUMBERS --> 1,3,4,5,6
1
3
4
5
6
SIGMA RHO10 (FT) --> 100.
SIGMA ALPH1 (DEG) --> 1.
SIGMA ALPH10 (DEG) --> 1.414
SIGMA DTOM1 (FT) --> 100.
SIGMA RHO10 (FT) --> 100.
INPUT RADAR <2> POSITION RELATIVE TO RADAR <1>
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) --> 10.
VECTOR RHO12 --> 10.000 0.000 0.000
INPUT <OWN> POSITION RELATIVE TO RADAR <1>
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) --> 10.60.
VECTOR RHO10 --> 5.000 8.660 0.000
INPUT <TARGET> POSITION RELATIVE TO <OWN>
DISTANCE (NM) AND ALTITUDE (FT) --> 5.
BETA START, INCREMENT (DEG) --> 30.5
BETA RANGE BEARING CEP
0 100.0000 0.3862 227.8727
5 100.0000 0.3953 232.2579
10 100.0000 0.4033 236.0843
15 100.0000 0.4102 239.3924
20 100.0000 0.4161 242.2249
25 100.0000 0.4210 244.6233
30 100.0000 0.4252 246.6253
35 100.0000 0.4285 248.2640
40 100.0000 0.4312 249.5673
45 100.0000 0.4333 250.5579
50 100.0000 0.4347 251.2532
55 100.0000 0.4355 251.6654
60 100.0000 0.4358 251.8921
65 100.0000 0.4355 251.6654
70 100.0000 0.4347 251.2532
75 100.0000 0.4333 250.5579
80 100.0000 0.4312 249.5673
85 100.0000 0.4285 248.2640
90 100.0000 0.4252 246.6253
95 100.0000 0.4210 244.6233
100 100.0000 0.4161 242.2249
105 100.0000 0.4102 239.3924
110 100.0000 0.4033 236.0843
115 100.0000 0.3953 232.2579
120 100.0000 0.3862 227.8727
125 100.0000 0.3757 222.8971
130 100.0000 0.3639 217.3191
135 100.0000 0.3508 211.1631

```

```

140
145
150
155
160
165
170
175
180
185
190
195
200
205
210
215
220
225
230
235
240
245
250
255
260
265
270
275
280
285
290
295
300
305
310
315
320
325
330
335
340
345
350
355
360
365
370

```

```

0.3764
0.3813
0.3862
0.3916
0.3977
0.4033
0.4091
0.4151
0.4210
0.4275
0.4347
0.4421
0.4497
0.4575
0.4655
0.4737
0.4821
0.4906
0.4992
0.5079
0.5167
0.5256
0.5346
0.5437
0.5529
0.5622
0.5716
0.5811
0.5907
0.5999
0.6092
0.6186
0.6281
0.6377
0.6474
0.6572
0.6671
0.6771
0.6871
0.6972
0.7074
0.7177
0.7281
0.7386
0.7491
0.7597
0.7704
0.7811
0.7919
0.8027
0.8136
0.8245
0.8355
0.8465
0.8576
0.8687
0.8798
0.8910
0.9022
0.9135
0.9248
0.9362
0.9476
0.9591
0.9706
0.9821
0.9937
1.0053
1.0169
1.0285
1.0401
1.0517
1.0633
1.0750
1.0866
1.0983
1.1100
1.1217
1.1334
1.1451
1.1568
1.1685
1.1802
1.1919
1.2036
1.2153
1.2270
1.2387
1.2504
1.2621
1.2738
1.2855
1.2972
1.3089
1.3206
1.3323
1.3440
1.3557
1.3674
1.3791
1.3908
1.4025
1.4142
1.4259
1.4376
1.4493
1.4610
1.4727
1.4844
1.4961
1.5078
1.5195
1.5312
1.5429
1.5546
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1.6248
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1.6716
1.6833
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1.7067
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1.7301
1.7418
1.7535
1.7652
1.7769
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1.9173
1.9290
1.9407
1.9524
1.9641
1.9758
1.9875
1.9992
2.0109
2.0226
2.0343
2.0460
2.0577
2.0694
2.0811
2.0928
2.1045
2.1162
2.1279
2.1396
2.1513
2.1630
2.1747
2.1864
2.1981
2.2098
2.2215
2.2332
2.2449
2.2566
2.2683
2.2799
2.2916
2.3033
2.3150
2.3267
2.3384
2.3501
2.3618
2.3735
2.3852
2.3969
2.4086
2.4203
2.4320
2.4437
2.4554
2.4671
2.4788
2.4905
2.5022
2.5139
2.5256
2.5373
2.5490
2.5607
2.5724
2.5841
2.5958
2.6075
2.6192
2.6309
2.6426
2.6543
2.6660
2.6777
2.6894
2.7011
2.7128
2.7245
2.7362
2.7479
2.7596
2.7713
2.7830
2.7947
2.8064
2.8181
2.8298
2.8415
2.8532
2.8649
2.8766
2.8883
2.8999
2.9116
2.9233
2.9350
2.9467
2.9584
2.9701
2.9818
2.9935
3.0052
3.0169
3.0286
3.0403
3.0520
3.0637
3.0754
3.0871
3.0988
3.1105
3.1222
3.1339
3.1456
3.1573
3.1690
3.1807
3.1924
3.2041
3.2158
3.2275
3.2392
3.2509
3.2626
3.2743
3.2860
3.2977
3.3094
3.3211
3.3328
3.3445
3.3562
3.3679
3.3796
3.3913
3.4030
3.4147
3.4264
3.4381
3.4498
3.4615
3.4732
3.4849
3.4966
3.5083
3.5200
3.5317
3.5434
3.5551
3.5668
3.5785
3.5902
3.6019
3.6136
3.6253
3.6370
3.6487
3.6604
3.6721
3.6838
3.6955
3.7072
3.7189
3.7306
3.7423
3.7540
3.7657
3.7774
3.7891
3.8008
3.8125
3.8242
3.8359
3.8476
3.8593
3.8710
3.8827
3.8944
3.9061
3.9178
3.9295
3.9412
3.9529
3.9646
3.9763
3.9880
4.0000

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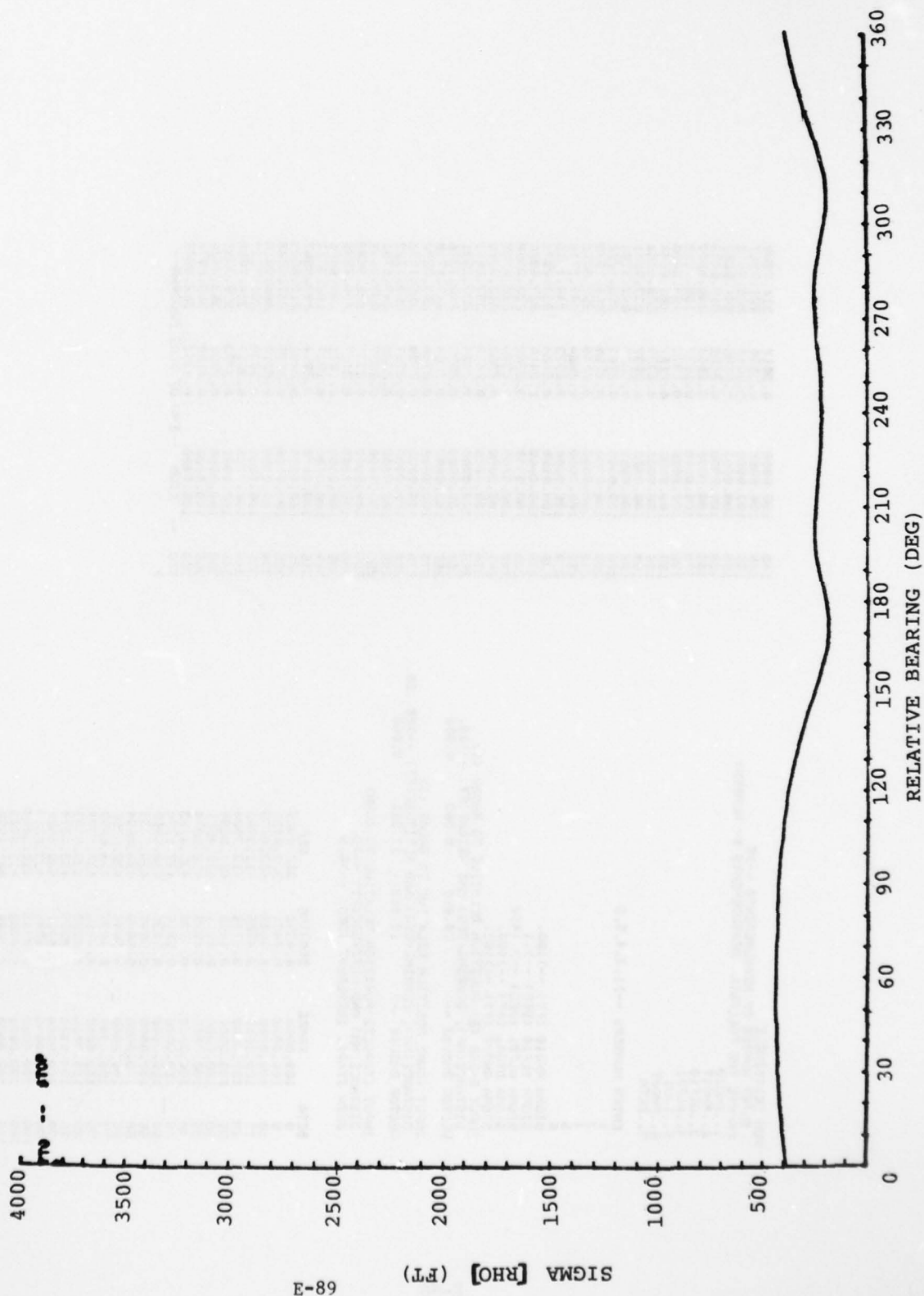
```

-- STOP --END OF BCAS PROGRAM--

```



SINGLE #20  
20,8 equivalent  
DABS





AD-A061 948

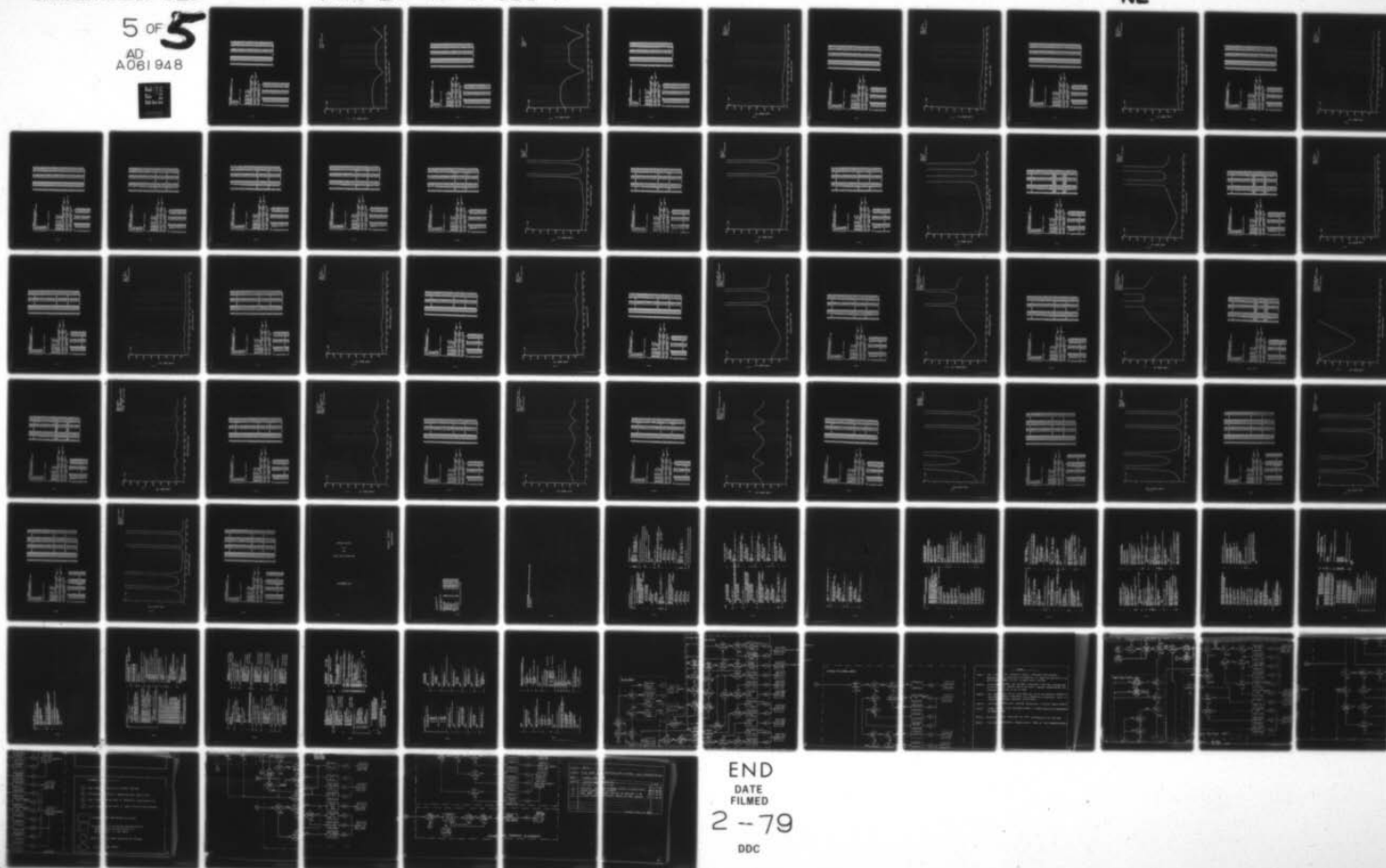
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFIC--ETC F/G 17/7  
FAA BCAS CONCEPT. VOLUME IIIA. APPENDICES A-E, (U)  
APR 78 E J KOENKE

UNCLASSIFIED

FAA-EM-78-5-III-A

NL

5 of 5  
AD  
A061 948





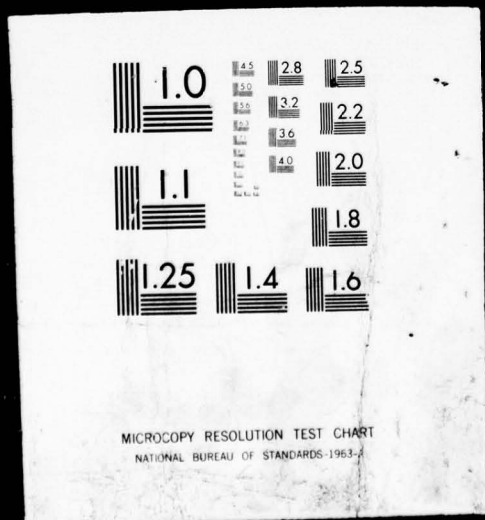
5 OF 5

5 OF

5

AD

061948





```

RUN DEL: SINGLE
ENTER NUMBER OF MEASUREMENTS --> 5
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..PHO10
2..PHO12
3..ALF10
4..ALF12
5..TAU1
6..RHO10
7..RHO12
ENTER NUMBERS --> 1,3,4,5,6
1
2
3
4
5
6
SIGMA RHO10 (FT) --> 100.
SIGMA ALF10 (DEG) --> .1
SIGMA ALF12 (DEG) --> .1414
SIGMA DT001 (FT) --> 100.
SIGMA RHO01 (FT) --> 100.
INPUT RADAR <2> POSITION RELATIVE TO RADAR <1>
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) --> 20.
VECTOR RHO12 --> 20.000 0.000 0.000
INPUT <OWN> POSITION RELATIVE TO RADAR <1>
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) --> 20.60.
VECTOR RHO10 --> 10.000 17.321 0.000
INPUT <TARGET> POSITION RELATIVE TO <OWN>
DISTANCE (NM) AND ALTITUDE (FT) --> 8.
BETA START, INCREMENT (DEG) --> 0.5
BETA RANGE BEARING CEP
0 100.0000 0.4352 382.4965
5 100.0000 0.4491 393.8811
10 100.0000 0.4608 403.4950
15 100.0000 0.4706 411.5703
20 100.0000 0.4788 418.3884
25 100.0000 0.4855 423.8864
30 100.0000 0.4911 428.4521
35 100.0000 0.4955 432.1274
40 100.0000 0.4999 435.0183
45 100.0000 0.5046 437.1774
50 100.0000 0.5093 438.6850
55 100.0000 0.5136 439.7556
60 100.0000 0.5179 440.4859
65 100.0000 0.5222 440.8826
70 100.0000 0.5262 440.9528
75 100.0000 0.5302 440.7979
80 100.0000 0.5342 440.4224
85 100.0000 0.5381 439.8321
90 100.0000 0.5421 438.9321
95 100.0000 0.5461 437.7384
100 100.0000 0.5501 436.2584
105 100.0000 0.5541 434.5089
110 100.0000 0.5581 432.4950
115 100.0000 0.5621 430.2311
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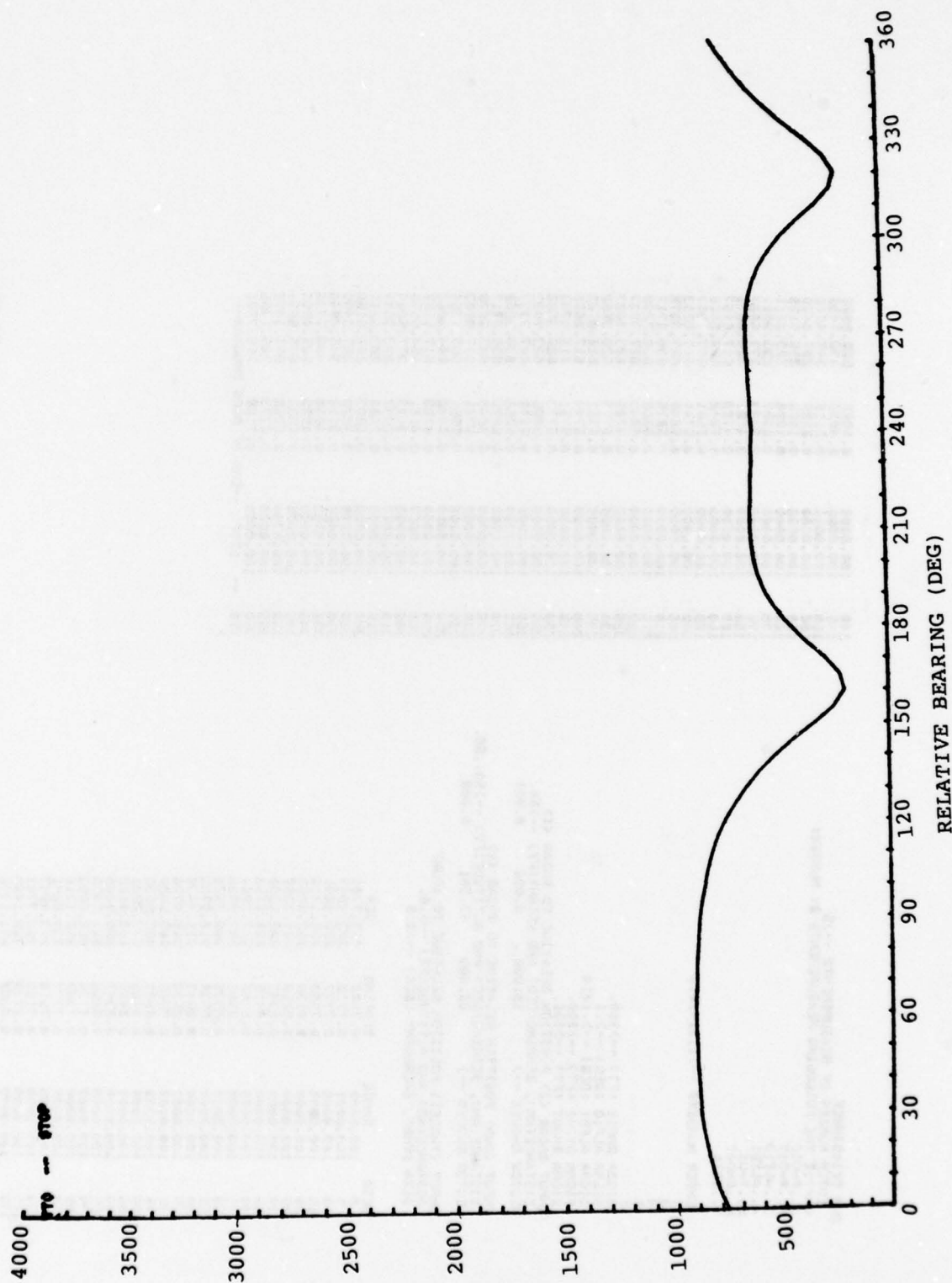
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SINGLE #20  
50.10 equivalent  
DABS

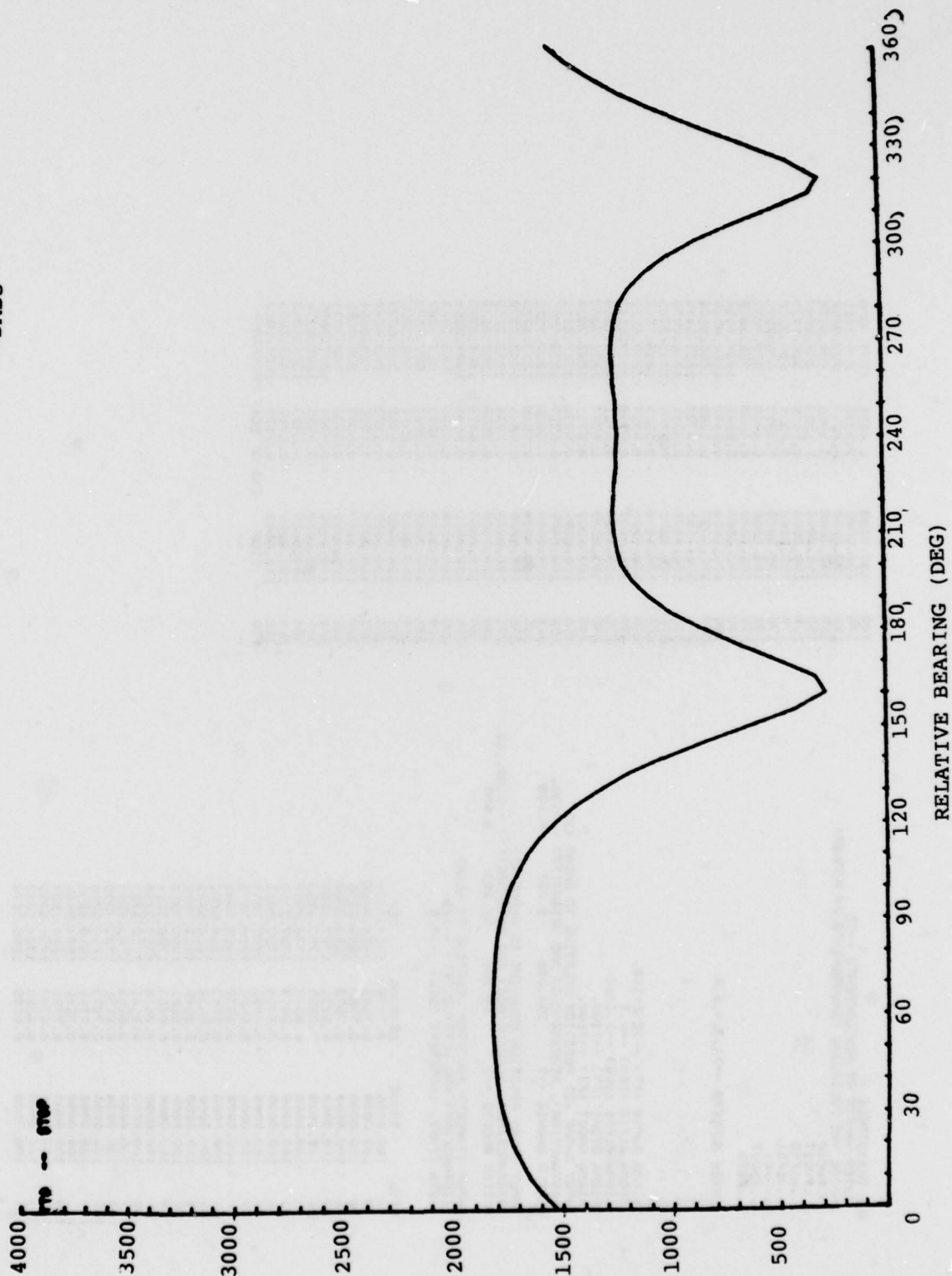








SINGLE #20  
100,20  
DABS





```

RUN DC1 SINGLE
ENTER NUMBER OF MEASUREMENTS --> 5
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..PH010
2..PH011
3..PH012
4..ALF01
5..T001
6..PH007
7..BETA
ENTER NUMBERS --> 1,3,4,5,6
1
3
4
6
SIGMA RH010 (FT) --> XCN100.
SIGMA ALF01 (DEG) --> .1
SIGMA ALF01 (DEG) --> .1414
SIGMA DT001 (FT) --> 100.
SIGMA RH007 (FT) --> 100.
INPUT RADAR (2) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) --> 100.
VECTOR RH012 --> 100.000 0.000 0.000
INPUT (C000) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) --> 100.00.
VECTOR RH010 --> 50.000 56.603 0.000
INPUT (TARGET) POSITION RELATIVE TO (C000)
DISTANCE (NM) AND ALTITUDE (FT) --> 20.
BETA START, INCREMENT (DEG) --> 0.5
BETA RANGE BEARING CEP
0 100.0000 0.7170 1524.1024
5 100.0000 0.7505 1504.9485
10 100.0000 0.7768 1500.6236
15 100.0000 0.7973 1503.8600
20 100.0000 0.8131 1527.4990
25 100.0000 0.8253 1753.1853
30 100.0000 0.8345 1772.6887
35 100.0000 0.8414 1787.3110
40 100.0000 0.8464 1798.0611
45 100.0000 0.8501 1805.7619
50 100.0000 0.8525 1810.7470
55 100.0000 0.8538 1813.6948
60 100.0000 0.8543 1815.6043
65 100.0000 0.8538 1813.6948
70 100.0000 0.8525 1810.7470
75 100.0000 0.8491 1805.7619
80 100.0000 0.8444 1798.0611
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90 100.0000 0.8314 1772.6887
95 100.0000 0.8235 1753.1853
100 100.0000 0.8151 1727.4990
105 100.0000 0.8063 1694.9485
110 100.0000 0.7973 1659.6236
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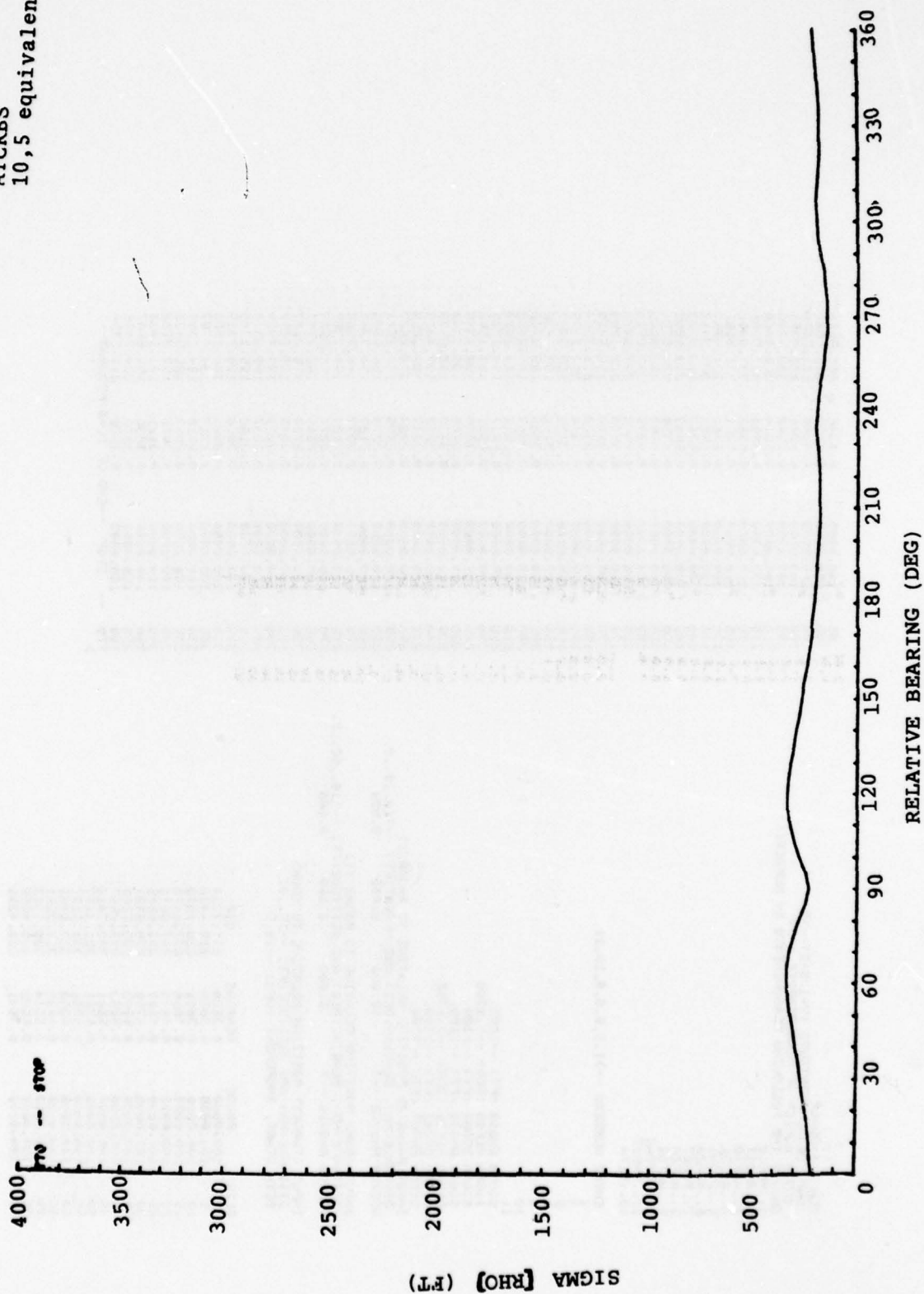
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185 100.0000 0.4206 1009.2378
190 100.0000 0.4014 1004.3264
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200 100.0000 0.3619 1000.5126
205 100.0000 0.3424 1000.6010
210 100.0000 0.3234 1000.6894
215 100.0000 0.3048 1000.7778
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225 100.0000 0.2694 1000.9546
230 100.0000 0.2526 1001.0430
235 100.0000 0.2364 1001.1314
240 100.0000 0.2208 1001.2198
245 100.0000 0.2058 1001.3082
250 100.0000 0.1914 1001.3966
255 100.0000 0.1776 1001.4850
260 100.0000 0.1644 1001.5734
265 100.0000 0.1518 1001.6618
270 100.0000 0.1400 1001.7502
275 100.0000 0.1288 1001.8386
280 100.0000 0.1182 1001.9270
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290 100.0000 0.0988 1002.1038
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315 100.0000 0.0597 1002.5458
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325 100.0000 0.0476 1002.7226
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675 100.0000 0.4372 1008.9106
680 100.0000 0.4234 1009.0000
685 100.0000 0.4086 1009.0884
690 100.0000 0.3929 1009.1768
695 100.0000 0.3764 1009.2652
700 100.0000 0.3592 1009.3536
705 100.0000 0.3414 1009.4420
710 100.0000 0.3230 1009.5304
715 100.0000 0.3042 1009.6188
720 100.0000 0.2850 1009.7072
725 100.0000 0.2654 1009.7956
730 100.0000 0.2454 1009.8840
735 100.0000 0.2250 1009.9724
740 100.0000 0.2042 1010.0608
745 100.0000 0.1830 1010.1492
750 100.0000 0.1614 1010.2376
755 100.0000 0.1394 1010.3260
760 100.0000 0.1170 1010.4144
765 100.0000 0.0942 1010.5028
770 100.0000 0.0710 1010.5912
775 100.0000 0.0474 1010.6796
780 100.0000 0.0234 1010.7680
785 100.0000 0.0000 1010.8564
790 100.0000 0.0000 1010.9448
795 100.0000 0.0000 1011.0332
800 100.0000 0.0000 1011.1216
805 100.0000 0.0000 1011.2100
810 100.0000 0.0000 1011.2984
815 100.0000 0.0000 1011.3868
820 100.0000 0.0000 1011.4752
825 100.0000 0.0000 1011.5636
830 100.0000 0.0000 1011.6520
835 100.0000 0.0000 1011.7404
840 100.0000 0.0000 1011.8288
845 100.0000 0.0000 1011.9172
850 100.0000 0.0000 1012.0056
855 100.0000 0.0000 1012.0940
860 100.0000 0.0000 1012.1824
865 100.0000 0.0000 1012.2708
870 100.0000 0.0000 1012.3592
875 100.0000 0.0000 1012.4476
880 100.0000 0.0000 1012.5360
885 100.0000 0.0000 1012.6244
890 100.0000 0.0000 1012.7128
895 100.0000 0.0000 1012.8012
900 100.0000 0.0000 1012.8896
905 100.0000 0.0000 1012.9780
910 100.0000 0.0000 1013.0664
915 100.0000 0.0000 1013.1548
920 100.0000 0.0000 1013.2432
925 100.0000 0.0000 1013.3316
930 100.0000 0.0000 1013.4200
935 100.0000 0.0000 1013.5084
940 100.0000 0.0000 1013.5968
945 100.0000 0.0000 1013.6852
950 100.0000 0.0000 1013.7736
955 100.0000 0.0000 1013.8620
960 100.0000 0.0000 1013.9504
965 100.0000 0.0000 1014.0388
970 100.0000 0.0000 1014.1272
975 100.0000 0.0000 1014.2156
980 100.0000 0.0000 1014.3040
985 100.0000 0.0000 1014.3924
990 100.0000 0.0000 1014.4808
995 100.0000 0.0000 1014.5692
1000 100.0000 0.0000 1014.6576
1005 100.0000 0.0000 1014.7460
1010 100.0000 0.0000 1014.8344
1015 100.0000 0.0000 1014.9228
1020 100.0000 0.0000 1015.0112
1025 100.0000 0.0000 1015.0996
1030 100.0000 0.0000 1015.1880
1035 100.0000 0.0000 1015.2764
1040 100.0000 0.0000 1015.3648
1045 100.0000 0.0000 1015.4532
1050 100.0000 0.0000 1015.5416
1055 100.0000 0.0000 1015.6300
1060 100.0000 0.0000 1015.7184
1065 100.0000 0.0000 1015.8068
1070 100.0000 0.0000 1015.8952
1075 100.0000 0.0000 1015.9836
1080 100.0000 0.0000 1016.0720
1085 100.0000 0.0000 1016.1604
1090 100.0000 0.0000 1016.2488
1095 100.0000 0.0000 1016.3372
1100 100.0000 0.0000 1016.4256
1105 100.0000 0.0000 1016.5140
1110 100.0000 0.0000 1016.6024
1115 100.0000 0.0000 1016.6908
1120 100.0000 0.0000 1016.7792
1125 100.0000 0.0000 1016.8676
1130 100.0000 0.0000 1016.9560
1135 100.0000 0.0000 1017.0444
1140 100.0000 0.0000 1017.1328
1145 100.0000 0.0000 1017.2212
1150 100.0000 0.0000 1017.3096
1155 100.0000 0.0000 1017.3980
1160 100.0000 0.0000 1017.4864
1165 100.0000 0.0000 1017.5748
1170 100.0000 0.0000 1017.6632
1175 100.0000 0.0000 1017.7516
1180 100.0000 0.0000 1017.8400
1185 100.0000 0.0000 1017.9284
1190 100.0000 0.0000 1018.0168
1195 100.0000 0.0000 1018.1052
1200 100.0000 0.0000 1018.1936
1205 100.0000 0.0000 1018.2820
1210 100.0000 0.0000 1018.3704
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1225 100.0000 0.0000 1018.6356
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1260 100.0000 0.0000 1019.2544
1265 100.0000 0.0000 1019.3428
1270 100.0000 0.0000 1019.4312
1275 100.0000 0.0000 1019.5196
1280 100.0000 0.0000 1019.6080
1285 100.0000 0.0000 1019.6964
1290 100.0000 0.0000 1019.7848
1295 100.0000 0.0000 1019.8732
1300 100.0000 0.0000 1019.9616
1305 100.0000 0.0000 1020.0500
1310 100.0000 0.0000 1020.1384
1315 100.0000 0.0000 1020.2268
1320 100.0000 0.0000 1020.3152
1325 100.0000 0.0000 1020.4036
1330 100.0000 0.0000 1020.4920
1335 100.0000 0.0000 1020.5804
1340 100.0000 0.0000 1020.6688
1345 100.0000 0.0000 1020.7572
1350 100.0000 0.0000 1020.8456
1355 100.0000 0.0000 1020.9340
1360 100.0000 0.0000 1021.0224
1365 100.0000 0.0000 1021.1108
1370 100.0000 0.0000 1021.1992
1375 100.0000 0.0000 1021.2876
1380 100.0000 0.0000 1021.3760
1385 100.0000 0.0000 1021.4644
1390 100.0000 0.0000 1021.5528
1395 100.0000 0.0000 1021.6412
1400 100.0000 0.0000 1021.7296
1405 100.0000 0.0000 1021.8180
1410 100.0000 0.0000 1021.9064
1415 100.0000 0.0000 1021.9948
1420 100.0000 0.0000 1022.0832
1425 100.0000 0.0000 1022.1716
1430 100.0000 0.0000 1022.2600
1435 100.0000 0.0000 1022.3484
1440 100.0000 0.0000 1022.4368
1445 100.0000 0.0000 1022.5252
1450 100.0000 0.0000 1022.6136
1455 100.0000 0.0000 1022.7020
1460 100.0000 0.0000 1022.7904
1465 100.0000 0.0000 1022.8788
1470 100.0000 0.0000 1022.9672
1475 100.0000 0.0000 1023.0556
1480 100.0000 0.0000 1023.1440
1485 100.0000 0.0000 1023.2324
1490 100.0000 0.0000 1023.3208
1495 100.0000 0.0000 1023.4092
1500 100.0000 0.0000 1023.4976
1505 100.0000 0.0000 1023.5860
1510 100.0000 0.0000 1023.6744
1515 100.0000 0.0000 1023.7628
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1525 100.0000 0.0000 1023.9396
1530 100.0000 0.0000 1024.0280
1535 100.0000 0.0000 1024.1164
1540 100.0000 0.0000 1024.2048
1545 100.0000 0.0000 1024.2932
1550 100.0000 0.0000 1024.3816
1555 100.0000 0.0000 1024.4700
1560 100.0000 0.0000 1024.5584
1565 100.0000 0.0000 1024.6468
1570 100.0000 0.0000 1024.7352
1575 100.0000 0.0000 1024.8236
1580 100.0000 0.0000 1024.9120
1585 100.0000 0.0000 1025.0004
1590 100.0000 0.0000 1025.0888
1595 100.0000 0.0000 1025.1772
1600 100.0000 0.0000 1025.2656
1605 100.0000 0.0000 1025.3540
1610 100.0000 0.0000 1025.4424
1615 100.0000 0.0000 1025.5308
1620 100.0000 0.0000 1025.6192
1625 100.0000 0.0000 1025.7076
1630 100.0000 0.0000 1025.7960
1635 100.0000 0.0000 1025.8844
1640 100.0000 0.0000 1025.9728
1645 100.0000 0.0000 1026.0612
1650 100.0000 0.0000 1026.1496
1655 100.0000 0.0000 1026.2380
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1665 100.0000 0.0000 1026.4148
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1695 100.0000 0.0000 1026.9452
1700 100.0000 0.0000 1027.0336
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1780 100.0000 0.0000 1028.4480
1785 100.0000 0.0000 1028.5364
1790 100.0000 0.0000 1028.6248
1795 100.0000 0.0000 1028.7132
1800 100.0000 0.0000 1028.8016
1805 100.0000 0.0000 1028.8900
1810 100.0000 0.0000 1028.9784
1815 100.0000 0.0000 1029.0668
1820 100.0000 0.0000 1029.1552
1825 100.0000 0.0000 1029.2436
1830 100.0000 0.0000 1029.3320
1835 100.0000 0.0000 1029.4204
1840 100.0000 0.0000 1029.5088
1845 100.0000 0.0000 1029.5972
1850 100.0000 0.0000 1029.6856
1855 100.0000 0.0000 1029.7740
1860 100.0000 0.0000 1029.8624
1865 100.0000 0.0000 1029.9508
1870 100.0000 0.0000 1030.0392
1875 100.0000 0.0000 1030.1276
1880 100.0000 0.0000 1030.2160
1885 100.0000 0.0000 1030.3044
1890 100.0000 0.0000 1030.3928
1895 100.0000 0.0000 1030.4812
1900 100.0000 0.0000 1030.5696
1905 100.0000 0.0000 1030.6580
1910 100.0000 0.0000 1030.7464
1915 100.0000 0.0000 1030.8348
1920 100.0000 0.0000 1030.9232
1925 100.0000 0.0000 1031.0116
1930 100.0000 0.0000 1031.1000
1935 100.0000 0.0000 1031.1884
1940 100.0000 0.0000 1031.2768
1945 100.0000 0.0000 1031.3652
1950 100.0000 0.0000 1031.4536
1955 10
```



DUAL #13  
SEMI-ACTIVE  
ATCRBS  
10,5 equivalent

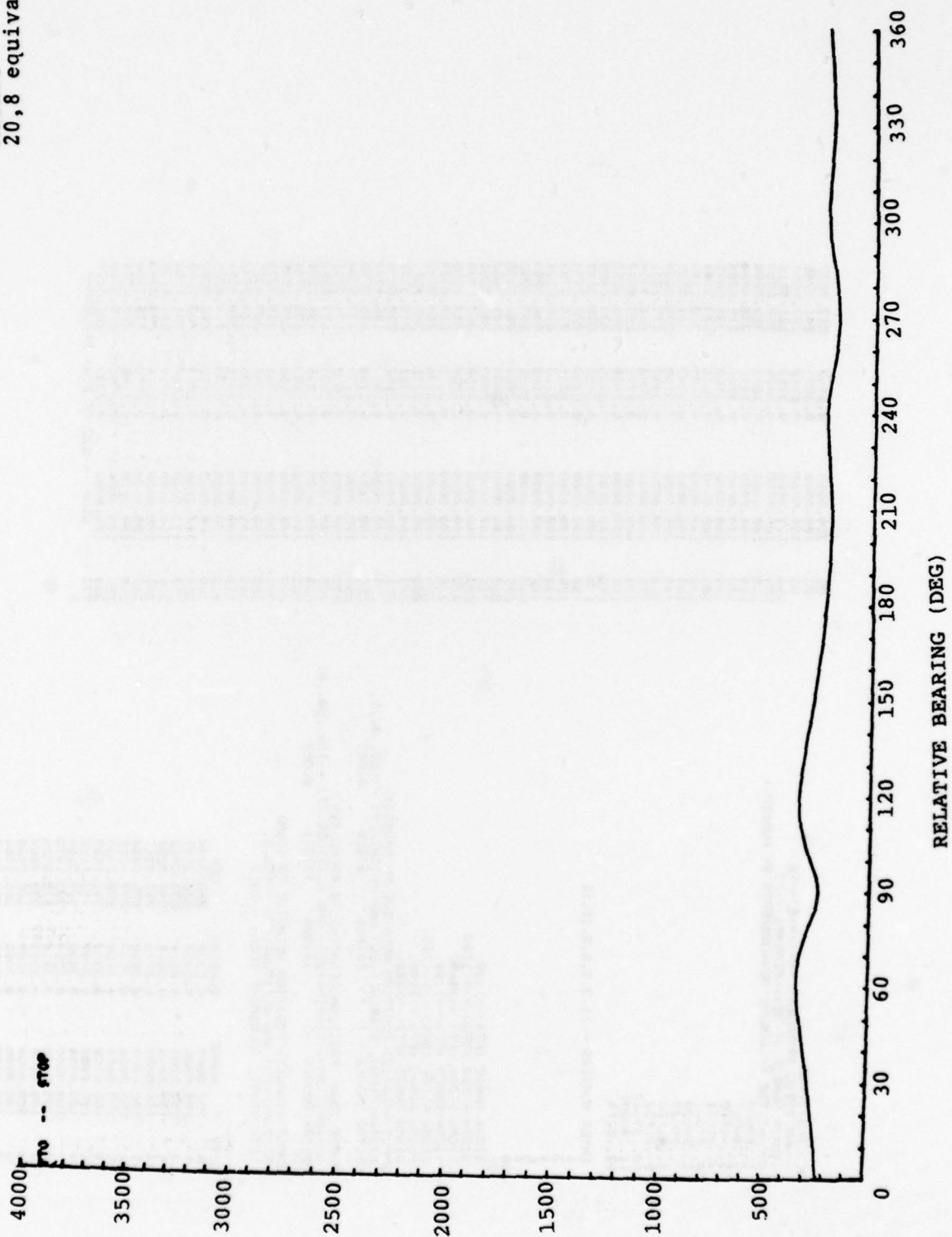








DUAL #13  
SEMI-ACTIVE  
ATCRBS  
20,8 equivalent



SIGMA (RHO) (FT)

E-97



```

01 N ININLP
  UNIT RETURN PRINTOUTS (Y=1,N=2)---28
  ENTER NUMBER OF MEASUREMENTS -->7
  CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER!!
  1..RHO10
  2..RHO1
  3..ALF10
  4..ALF1
  5..DTH1
  6..DTH1
  7..RHO2
  8..ALF2
  9..ALF2
  10..DTH2
  11..RHO2
  12..BETA

  ENTER NUMBERS -->1,3,5,6,8,10,11
  1
  3
  5
  6
  8
  10
  11
  SIGMA RHO10 (FT) -->100.
  SIGMA ALF10 (DEG) -->1.768
  SIGMA DTH1 (FT) -->100.
  SIGMA RHO20 (FT) -->100.
  SIGMA ALF20 (DEG) -->1.768
  SIGMA DTH2 (FT) -->100.
  SIGMA RHO2 (FT) -->100.
  INPUT RADAR(2) POSITION RELATIVE TO RADAR(1)
  DISTANCE(M), BEARING(DEG) AND HEIGHT(FT) -->20.0,0.0,
  VECTOR RHO12 -->
  0.000 0.000 0.000

  INPUT 'COUNT' POSITION RELATIVE TO RADAR (1)
  DISTANCE(M), BEARING(DEG) AND ALTITUDE(FT) -->20.00,0.0,
  VECTOR RHO10 -->
  10.000 17.331 0.000

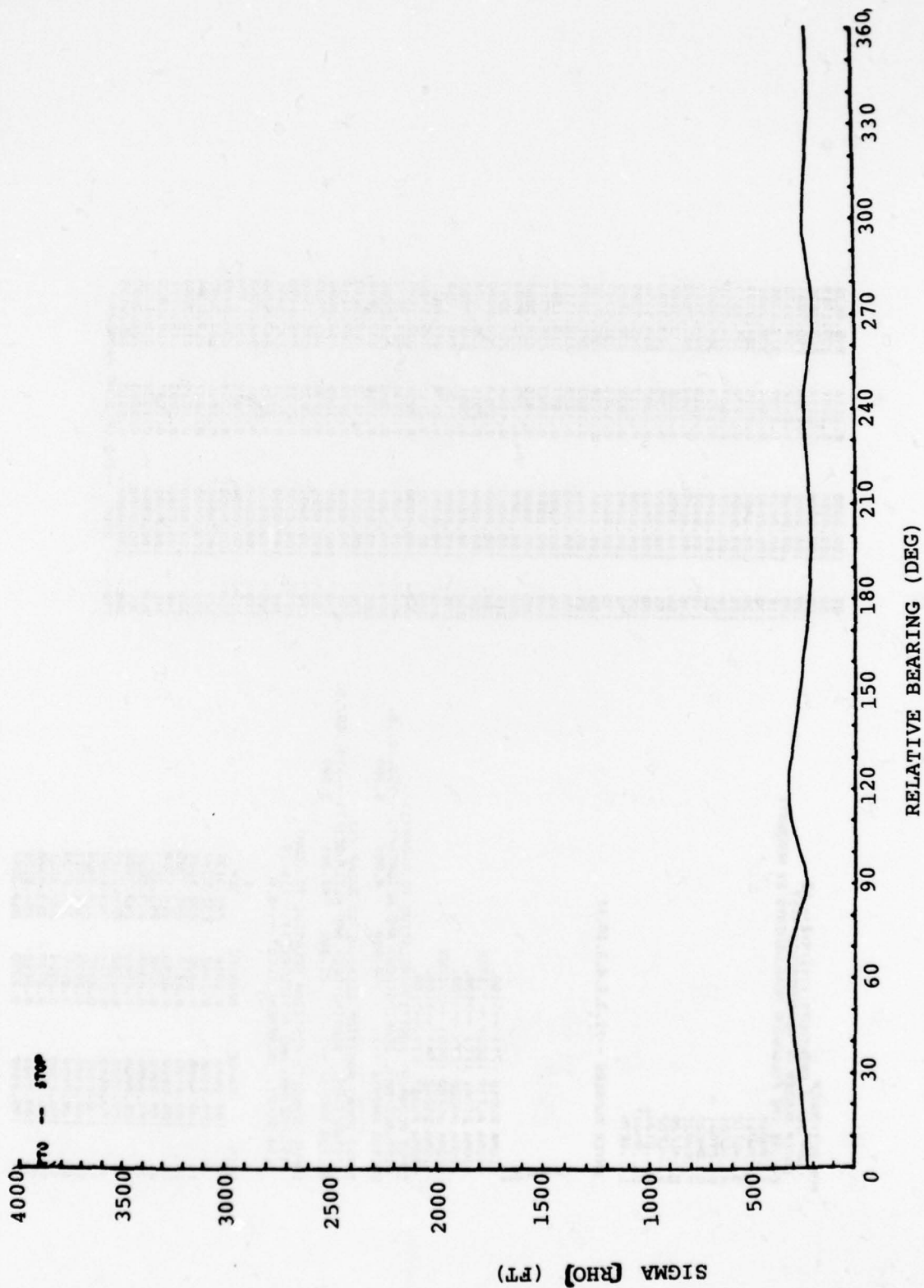
  INPUT 'TARGET' POSITION RELATIVE TO COUNT
  DISTANCE(M), BEARING(DEG) AND ALTITUDE(FT) -->28.0,
  BETA START, INCREMENT (DEG) -->0.5

  BETA RANGE BEARING CEP
  0 100.0000 222.2074
  5 100.0000 0.2330 229.3047
  10 100.0000 0.2432 237.2468
  15 100.0000 0.2536 246.0250
  20 100.0000 0.2650 255.6317
  25 100.0000 0.2773 266.0434
  30 100.0000 0.2906 277.1081
  35 100.0000 0.3047 288.9624
  40 100.0000 0.3196 301.6827
  45 100.0000 0.3347 313.1126
  50 100.0000 0.3497 324.3104
  55 100.0000 0.3636 333.5078
  60 100.0000 0.3750 338.9784
  65 100.0000 0.3818 338.4064
  70 100.0000 0.3811 329.2080
  75 100.0000 0.3697 309.6904
  80 100.0000 0.3103 281.6212

```



DUAL #13  
SEMI-ACTIVE  
ATCRBS  
50,10 equivalent

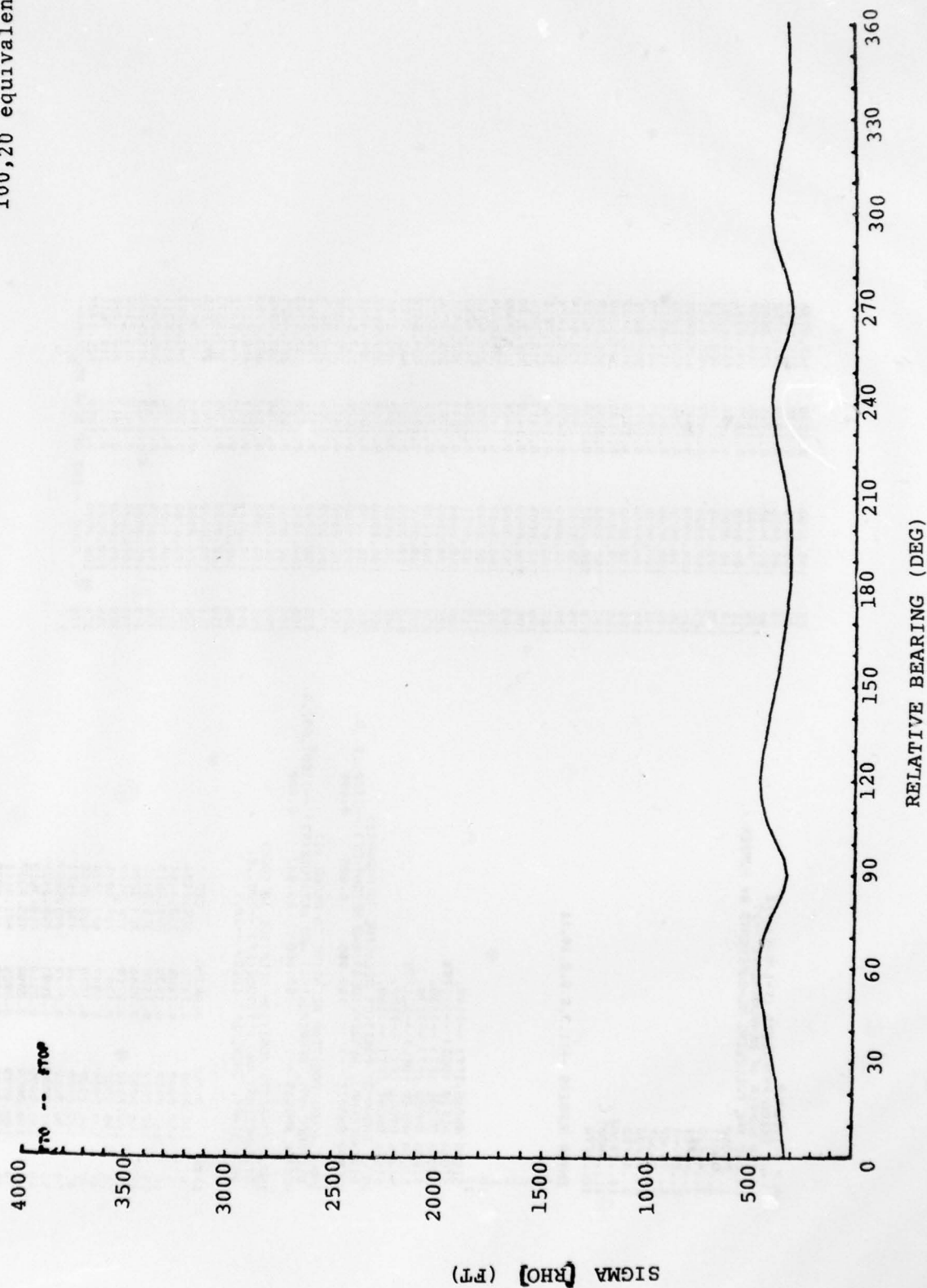








DUAL #13  
SEMI-ACTIVE  
ATCRBS  
100,20 equivalent





```

      1. MAIN PROGRAM
      2. LET TREC BEG PRINTOUTS (N-1,N-2) -->2
      3. ENTER NUMBER OF MEASUREMENTS -->2
      4. CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER::
      5. 1..RHO10
      6. 2..RHO11
      7. 3..RHO12
      8. 4..RHO13
      9. 5..RHO14
      10. 6..RHO15
      11. 7..RHO16
      12. 8..RHO17
      13. 9..RHO18
      14. 10..RHO19
      15. 11..RHO20
      16. 12..BETA
      17. ENTER NUMBERS -->1,3,5,6,8,10,11
      18. 1
      19. 3
      20. 5
      21. 6
      22. 8
      23. 10
      24. 11
      25. SIGMA RHO10 (FT) -->100
      26. SIGMA ALF10 (DEG) -->1.768
      27. SIGMA D10AL (FT) -->100
      28. SIGMA RHO20 (FT) -->100
      29. SIGMA ALF20 (DEG) -->1.768
      30. SIGMA D20AL (FT) -->100
      31. SIGMA RHO11 (FT) -->100
      32. SIGMA ALF11 (DEG) -->1.768
      33. SIGMA D11AL (FT) -->100
      34. SIGMA RHO12 (FT) -->100
      35. SIGMA ALF12 (DEG) -->1.768
      36. SIGMA D12AL (FT) -->100
      37. SIGMA RHO13 (FT) -->100
      38. SIGMA ALF13 (DEG) -->1.768
      39. SIGMA D13AL (FT) -->100
      40. SIGMA RHO14 (FT) -->100
      41. SIGMA ALF14 (DEG) -->1.768
      42. SIGMA D14AL (FT) -->100
      43. SIGMA RHO15 (FT) -->100
      44. SIGMA ALF15 (DEG) -->1.768
      45. SIGMA D15AL (FT) -->100
      46. SIGMA RHO16 (FT) -->100
      47. SIGMA ALF16 (DEG) -->1.768
      48. SIGMA D16AL (FT) -->100
      49. SIGMA RHO17 (FT) -->100
      50. SIGMA ALF17 (DEG) -->1.768
      51. SIGMA D17AL (FT) -->100
      52. SIGMA RHO18 (FT) -->100
      53. SIGMA ALF18 (DEG) -->1.768
      54. SIGMA D18AL (FT) -->100
      55. SIGMA RHO19 (FT) -->100
      56. SIGMA ALF19 (DEG) -->1.768
      57. SIGMA D19AL (FT) -->100
      58. SIGMA RHO20 (FT) -->100
      59. SIGMA ALF20 (DEG) -->1.768
      60. SIGMA D20AL (FT) -->100
      61. INPUT RADAR(S) POSITION RELATIVE TO RADAR(1)
      62. DISTANCE(M), BEARING(DEG) AND HEIGHT(FT) -->100..0..0.
      63. VECTOR RHO10 --> 100.000 0.000 0.000
      64. INPUT (COUN) POSITION RELATIVE TO RADAR (1)
      65. DISTANCE(M), BEARING(DEG) AND ALTITUDE(FT) -->100..00..0.
      66. VECTOR RHO10 --> 50.000 86.603 0.000
      67. INPUT (TARGET) POSITION RELATIVE TO (COUN)
      68. DISTANCE(M) AND ALTITUDE(FT) -->20..0.
      69. BETA START, INCREMENT (DEG) -->0.5
      70. BETA RANGE BEARING CEP
      71. 0 100.0000 0.1459 325.1424
      72. 5 100.0000 0.1495 332.4484
      73. 10 100.0000 0.1539 341.4213
      74. 15 100.0000 0.1590 351.8418
      75. 20 100.0000 0.1648 363.5289
      76. 25 100.0000 0.1719 376.3169
      77. 30 100.0000 0.1777 390.0971
      78. 35 100.0000 0.1848 404.3570
      79. 40 100.0000 0.1936 418.0556
      80. 45 100.0000 0.2047 431.0597
      81. 50 100.0000 0.2187 443.4481
      82. 55 100.0000 0.2363 455.2512
      83. 60 100.0000 0.2586 465.5307
      84. 65 100.0000 0.2856 474.0181
      85. 70 100.0000 0.3185 480.8559
      86. 75 100.0000 0.3581 485.1424
      87. 80 100.0000 0.4118 487.8549

```











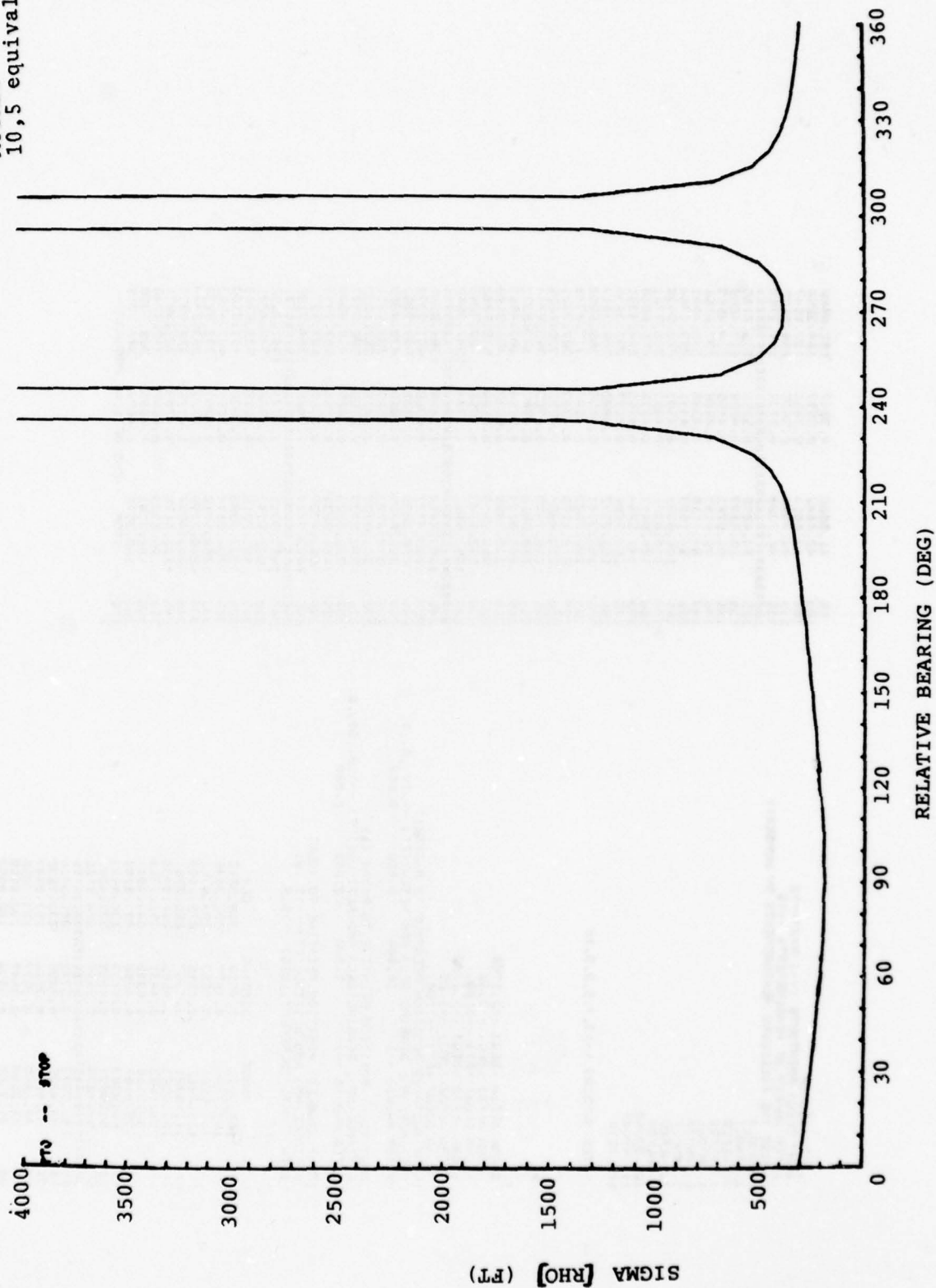




E-110



DUAL #26  
PASSIVE  
ATCRBS  
10,5 equivalent

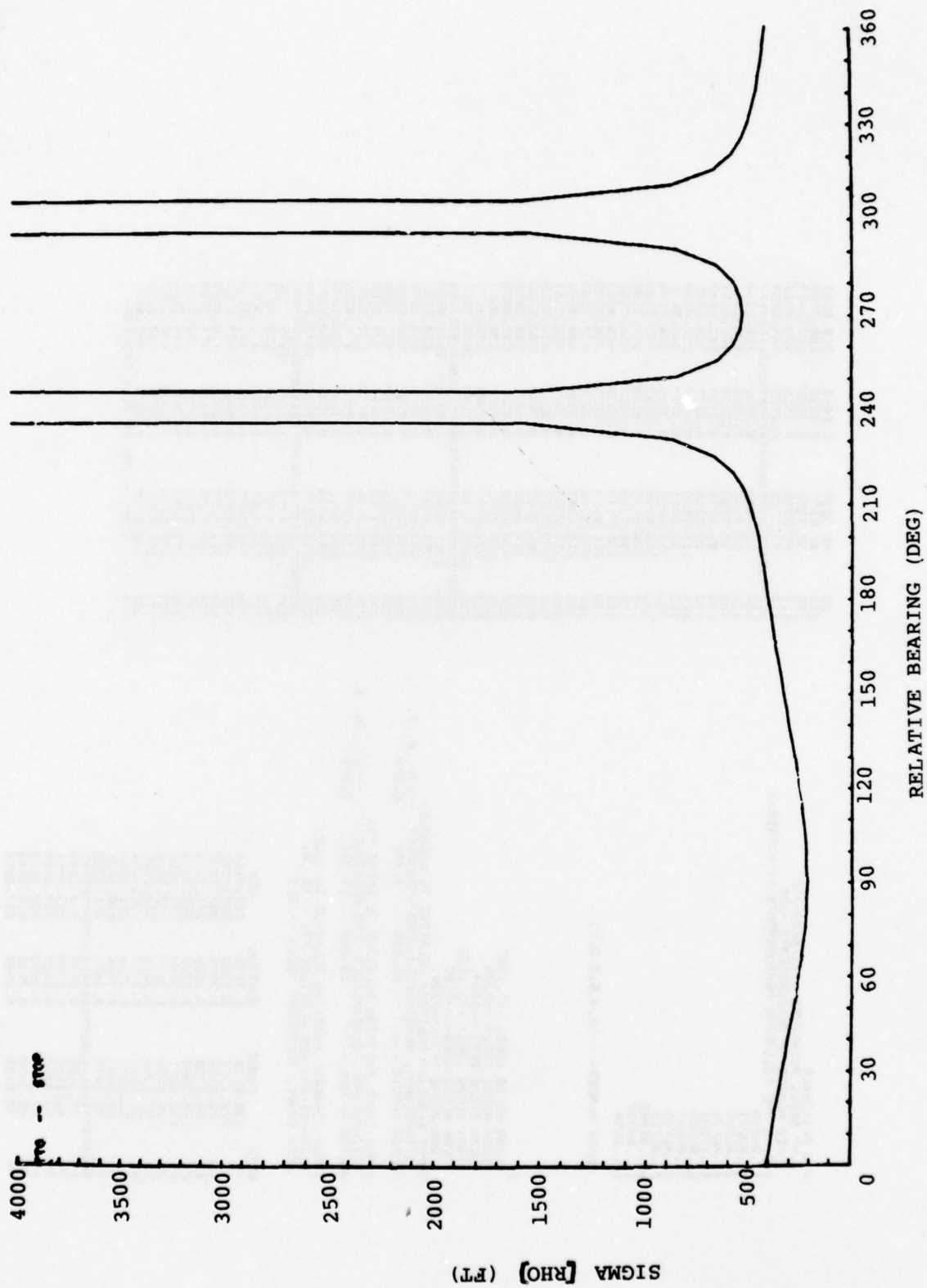




[illegible]



DUAL #26  
ATCRBS  
20,8 equivalent





```

*P1 INITIALP
UN- DEFC POINTOUTS (V=1,N=2)-->8
ENTER NUMBER OF MEASUREMENTS -->8
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:1
1..RHO10
2..RHO11
3..ALF10
4..ALF11
5..DTOM1
6..RHO20
7..RHO21
8..ALF20
9..ALF21
10..DTOM2
11..RHO22
12..BETA
ENTER NUMBERS -->3,4,5,8,9,10
3
4
5
6
7
8
9
10
SIGMA ALF10 (DEG) -->1.768
SIGMA ALF11 (DEG) -->1.25
SIGMA DTOM1 (FT) -->109
SIGMA ALF20 (DEG) -->1.768
SIGMA ALF21 (DEG) -->1.25
SIGMA DTOM2 (FT) -->109
INPUT RADAR(1) POSITION RELATIVE TO RADAR(1)
DISTANCE(NM), BEARING(DEG) AND HEIGHT(FT) -->20,0,0.
VECTOR RHO102 -->20.000 0.000 0.000
INPUT RADAR(2) POSITION RELATIVE TO RADAR(2)
DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) -->20,0,0.
VECTOR RHO110 -->10.000 17.321 0.000
INPUT TARGET POSITION RELATIVE TO COMND
DISTANCE(NM) AND ALTITUDE(FT) -->8,0.
BETA START, INCREMENT (DEG) -->0.5
BETA RANGE BEARING CEP
5 230.2140 0.3976 408.4064
10 200.7312 0.3966 396.4882
15 180.6136 0.3948 384.3159
20 160.9708 0.3908 371.8199
25 143.8201 0.3839 358.9889
30 115.6899 0.3674 345.8558
35 92.8355 0.3571 332.4908
40 73.6883 0.3434 305.4944
45 62.8446 0.3266 279.1641
50 55.1030 0.3076 266.7303
55 47.3425 0.2828 244.6894
60 46.5628 0.2720 235.4211
65 46.0252 0.2620 227.0457
70 47.6977 0.2559 222.3099
75 48.3639 0.2516 218.8543
80 48.6188 0.2501 217.6852

```

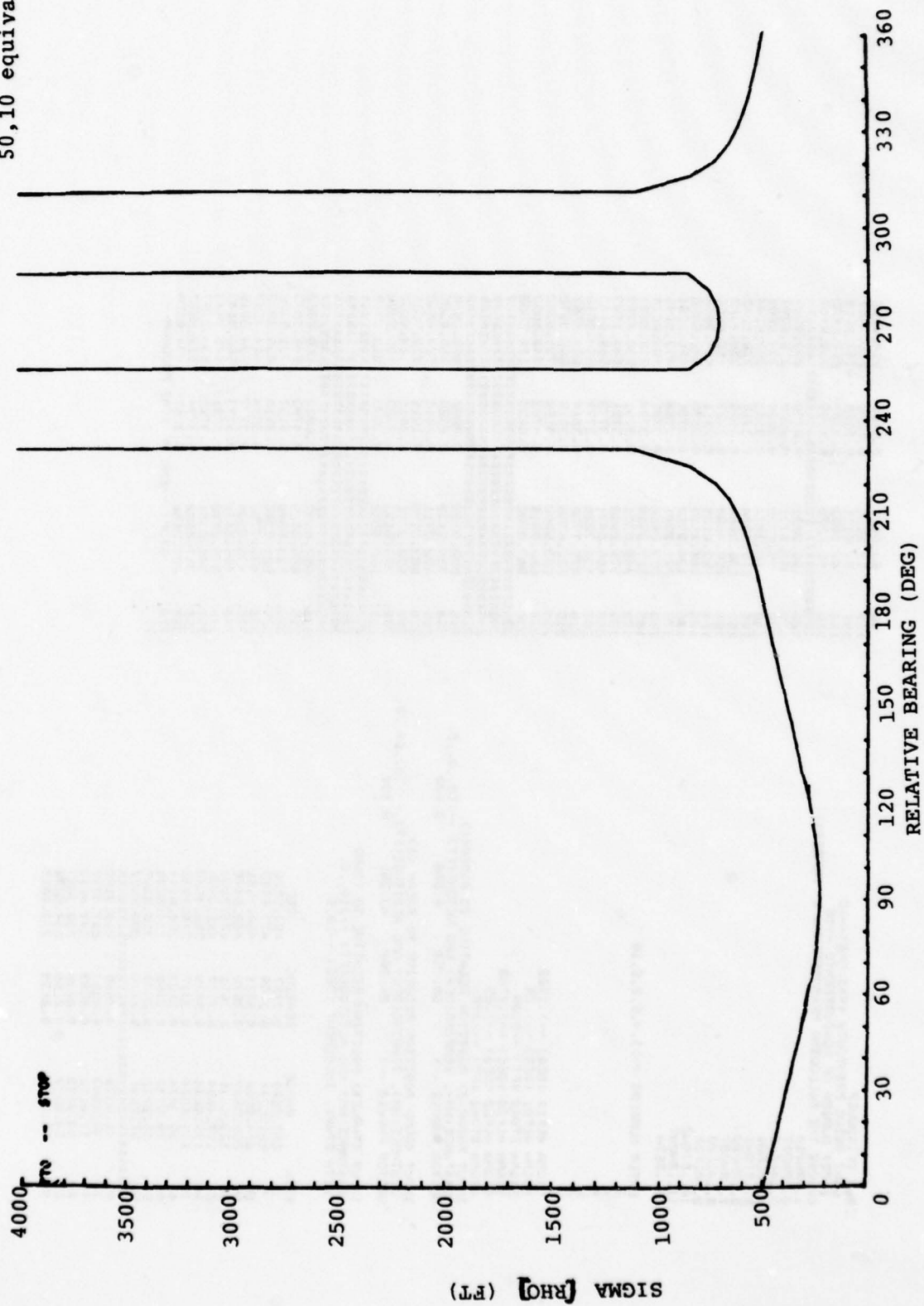
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86 48.3639 0.2516 218.8543
100 47.6977 0.2559 222.3099
110 46.5628 0.2720 235.4211
115 46.0252 0.2620 227.0457
118 45.8201 0.2559 222.3099
120 45.6899 0.2516 218.8543
125 45.4908 0.2434 205.4944
130 45.3425 0.2306 179.1641
135 45.1030 0.2076 166.7303
140 44.8558 0.1839 153.8558
145 44.6188 0.1571 140.8552
150 44.3825 0.1288 127.4882
155 44.1464 0.0996 114.0882
160 43.9103 0.0696 100.6882
165 43.6742 0.0396 87.2882
170 43.4381 0.0096 73.8882
175 43.2020 0.0000 60.4882
180 42.9659 0.0000 47.0882
185 42.7298 0.0000 33.6882
190 42.4937 0.0000 20.2882
195 42.2576 0.0000 6.8882
200 42.0215 0.0000 0.0000
205 41.7854 0.0000 0.0000
210 41.5493 0.0000 0.0000
215 41.3132 0.0000 0.0000
220 41.0771 0.0000 0.0000
225 40.8410 0.0000 0.0000
230 40.6049 0.0000 0.0000
235 40.3688 0.0000 0.0000
240 40.1327 0.0000 0.0000
245 39.8966 0.0000 0.0000
250 39.6605 0.0000 0.0000
255 39.4244 0.0000 0.0000
260 39.1883 0.0000 0.0000
265 38.9522 0.0000 0.0000
270 38.7161 0.0000 0.0000
275 38.4800 0.0000 0.0000
280 38.2439 0.0000 0.0000
285 38.0078 0.0000 0.0000
290 37.7717 0.0000 0.0000
295 37.5356 0.0000 0.0000
300 37.2995 0.0000 0.0000
305 37.0634 0.0000 0.0000
310 36.8273 0.0000 0.0000
315 36.5912 0.0000 0.0000
320 36.3551 0.0000 0.0000
325 36.1190 0.0000 0.0000
330 35.8829 0.0000 0.0000
335 35.6468 0.0000 0.0000
340 35.4107 0.0000 0.0000
345 35.1746 0.0000 0.0000
350 34.9385 0.0000 0.0000
355 34.7024 0.0000 0.0000
360 34.4663 0.0000 0.0000
365 34.2302 0.0000 0.0000
370 33.9941 0.0000 0.0000
375 33.7580 0.0000 0.0000
380 33.5219 0.0000 0.0000
385 33.2858 0.0000 0.0000
390 33.0497 0.0000 0.0000
395 32.8136 0.0000 0.0000
400 32.5775 0.0000 0.0000
405 32.3414 0.0000 0.0000
410 32.1053 0.0000 0.0000
415 31.8692 0.0000 0.0000
420 31.6331 0.0000 0.0000
425 31.3970 0.0000 0.0000
430 31.1609 0.0000 0.0000
435 30.9248 0.0000 0.0000
440 30.6887 0.0000 0.0000
445 30.4526 0.0000 0.0000
450 30.2165 0.0000 0.0000
455 29.9804 0.0000 0.0000
460 29.7443 0.0000 0.0000
465 29.5082 0.0000 0.0000
470 29.2721 0.0000 0.0000
475 29.0360 0.0000 0.0000
480 28.8000 0.0000 0.0000
485 28.5639 0.0000 0.0000
490 28.3278 0.0000 0.0000
495 28.0917 0.0000 0.0000
500 27.8556 0.0000 0.0000
505 27.6195 0.0000 0.0000
510 27.3834 0.0000 0.0000
515 27.1473 0.0000 0.0000
520 26.9112 0.0000 0.0000
525 26.6751 0.0000 0.0000
530 26.4390 0.0000 0.0000
535 26.2029 0.0000 0.0000
540 25.9668 0.0000 0.0000
545 25.7307 0.0000 0.0000
550 25.4946 0.0000 0.0000
555 25.2585 0.0000 0.0000
560 25.0224 0.0000 0.0000
565 24.7863 0.0000 0.0000
570 24.5502 0.0000 0.0000
575 24.3141 0.0000 0.0000
580 24.0780 0.0000 0.0000
585 23.8419 0.0000 0.0000
590 23.6058 0.0000 0.0000
595 23.3697 0.0000 0.0000
600 23.1336 0.0000 0.0000
605 22.8975 0.0000 0.0000
610 22.6614 0.0000 0.0000
615 22.4253 0.0000 0.0000
620 22.1892 0.0000 0.0000
625 21.9531 0.0000 0.0000
630 21.7170 0.0000 0.0000
635 21.4809 0.0000 0.0000
640 21.2448 0.0000 0.0000
645 21.0087 0.0000 0.0000
650 20.7726 0.0000 0.0000
655 20.5365 0.0000 0.0000
660 20.3004 0.0000 0.0000
665 20.0643 0.0000 0.0000
670 19.8282 0.0000 0.0000
675 19.5921 0.0000 0.0000
680 19.3560 0.0000 0.0000
685 19.1199 0.0000 0.0000
690 18.8838 0.0000 0.0000
695 18.6477 0.0000 0.0000
700 18.4116 0.0000 0.0000
705 18.1755 0.0000 0.0000
710 17.9394 0.0000 0.0000
715 17.7033 0.0000 0.0000
720 17.4672 0.0000 0.0000
725 17.2311 0.0000 0.0000
730 16.9950 0.0000 0.0000
735 16.7589 0.0000 0.0000
740 16.5228 0.0000 0.0000
745 16.2867 0.0000 0.0000
750 16.0506 0.0000 0.0000
755 15.8145 0.0000 0.0000
760 15.5784 0.0000 0.0000
765 15.3423 0.0000 0.0000
770 15.1062 0.0000 0.0000
775 14.8701 0.0000 0.0000
780 14.6340 0.0000 0.0000
785 14.3979 0.0000 0.0000
790 14.1618 0.0000 0.0000
795 13.9257 0.0000 0.0000
800 13.6896 0.0000 0.0000
805 13.4535 0.0000 0.0000
810 13.2174 0.0000 0.0000
815 12.9813 0.0000 0.0000
820 12.7452 0.0000 0.0000
825 12.5091 0.0000 0.0000
830 12.2730 0.0000 0.0000
835 12.0369 0.0000 0.0000
840 11.8008 0.0000 0.0000
845 11.5647 0.0000 0.0000
850 11.3286 0.0000 0.0000
855 11.0925 0.0000 0.0000
860 10.8564 0.0000 0.0000
865 10.6203 0.0000 0.0000
870 10.3842 0.0000 0.0000
875 10.1481 0.0000 0.0000
880 9.9120 0.0000 0.0000
885 9.6759 0.0000 0.0000
890 9.4398 0.0000 0.0000
895 9.2037 0.0000 0.0000
900 8.9676 0.0000 0.0000
905 8.7315 0.0000 0.0000
910 8.4954 0.0000 0.0000
915 8.2593 0.0000 0.0000
920 8.0232 0.0000 0.0000
925 7.7871 0.0000 0.0000
930 7.5510 0.0000 0.0000
935 7.3149 0.0000 0.0000
940 7.0788 0.0000 0.0000
945 6.8427 0.0000 0.0000
950 6.6066 0.0000 0.0000
955 6.3705 0.0000 0.0000
960 6.1344 0.0000 0.0000
965 5.8983 0.0000 0.0000
970 5.6622 0.0000 0.0000
975 5.4261 0.0000 0.0000
980 5.1900 0.0000 0.0000
985 4.9539 0.0000 0.0000
990 4.7178 0.0000 0.0000
995 4.4817 0.0000 0.0000
1000 4.2456 0.0000 0.0000

```



DUAL #26  
PASSIVE  
ATCRBS  
50,10 equivalent





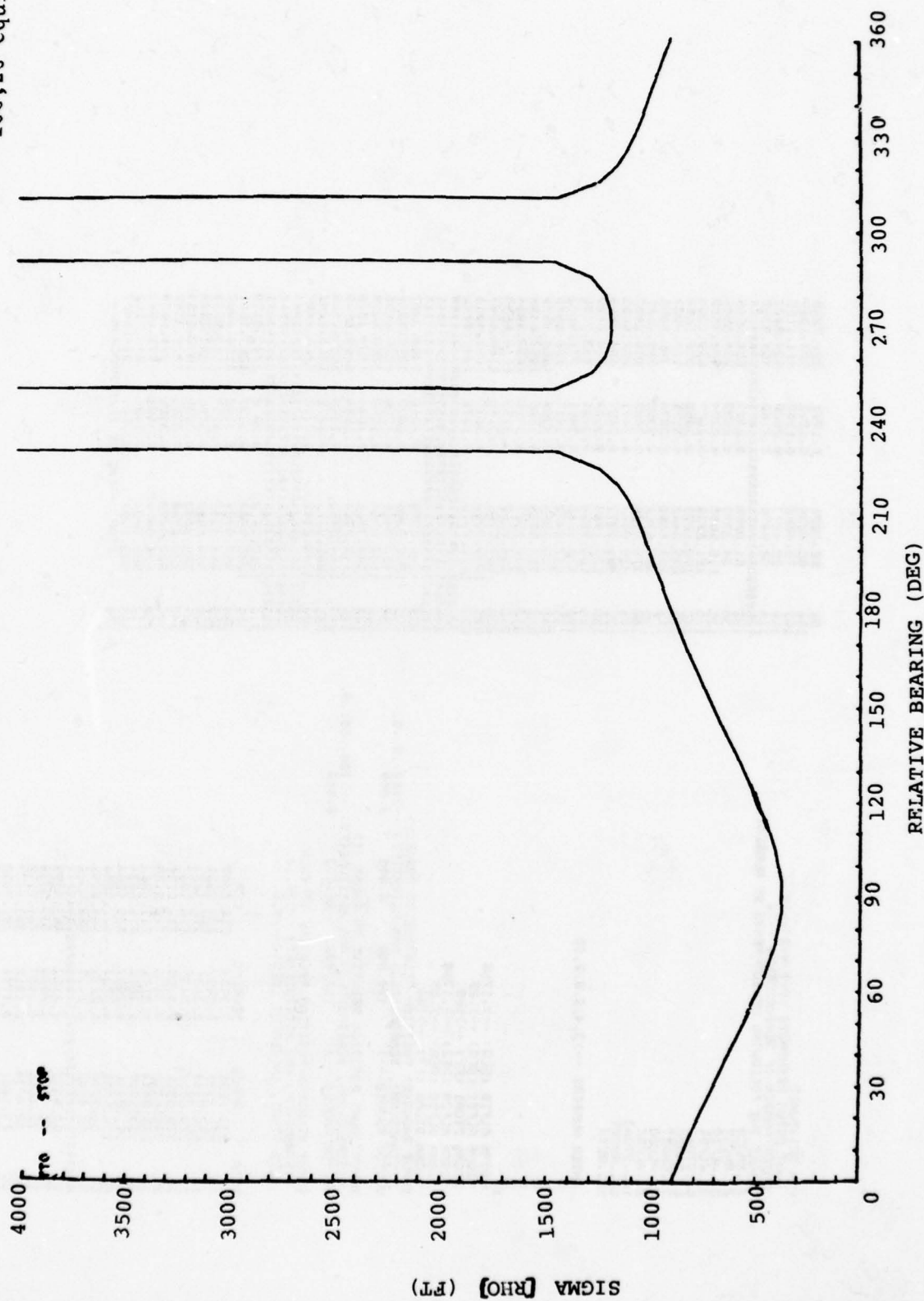
```

: RUN N11N1ULP
: UNIT READING PRINTOUTS (V1,N08) -->8
: ENTER INCREMENT OF MEASUREMENTS -->8
: CHANGE THE FOLLOWING MEASUREMENTS BY NUMBER:1
1..RHO10
2..RHO11
3..RHO12
4..RHO13
5..RHO14
6..RHO15
7..RHO16
8..RHO17
9..RHO18
10..RHO19
11..RHO20
12..BETH
ENTER NUMBERS -->3,4,5,8,9,10
3
4
5
6
7
8
9
10
SIGMA ALF10 (DEG) -->.1768
SIGMA ALF01 (DEG) -->.25
SIGMA DT041 (FT) -->100.
SIGMA ALF20 (DEG) -->.1768
SIGMA ALF02 (DEG) -->.25
SIGMA DT042 (FT) -->100.
INPUT RADAR(2) POSITION RELATIVE TO RADAR(1)
DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) -->50.0.0.0.
VECTOR RHO12 -->50.000 0.000 0.000
INPUT (COUN) POSITION RELATIVE TO RADAR (1)
DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) -->50.00.0.0.
VECTOR RHO13 -->25.000 43.301 0.000
INPUT (COUN) POSITION RELATIVE TO (COUN)
DISTANCE(NM) AND ALTITUDE(FT) -->10.0.
BETH START, INCREMENT (DEG) -->0.5
BETH
0 280.2680 BEARING CEP
5 261.8221 0.3787 494.9270
10 234.9762 0.3766 477.5845
15 208.2567 0.3731 460.1581
20 183.6131 0.3679 445.5442
25 159.4694 0.3611 424.7052
30 136.6644 0.3527 406.6556
35 115.4944 0.3429 388.4529
40 96.3074 0.3317 370.1942
45 79.5772 0.3193 352.6144
50 65.5731 0.3060 334.0880
55 52.5731 0.2928 316.6397
60 40.0379 0.2778 299.9029
65 28.4079 0.2628 283.8863
70 17.2663 0.2473 268.5109
75 6.5111 0.2317 253.8863
80 0.0000 0.2160 239.5109
85 0.0000 0.2003 225.0000
90 0.0000 0.1846 210.5109
95 0.0000 0.1689 196.0000
100 0.0000 0.1532 181.5109
105 0.0000 0.1375 167.0000
110 0.0000 0.1218 152.5109
115 0.0000 0.1061 138.0000
120 0.0000 0.0904 123.5109
125 0.0000 0.0747 109.0000
130 0.0000 0.0590 94.5109
135 0.0000 0.0433 80.0000
140 0.0000 0.0276 65.5109
145 0.0000 0.0119 51.0000
150 0.0000 0.0000 36.5109
155 0.0000 0.0000 22.0000
160 0.0000 0.0000 7.5109
165 0.0000 0.0000 0.0000
170 0.0000 0.0000 0.0000
175 0.0000 0.0000 0.0000
180 0.0000 0.0000 0.0000
185 0.0000 0.0000 0.0000
190 0.0000 0.0000 0.0000
195 0.0000 0.0000 0.0000
200 0.0000 0.0000 0.0000
205 0.0000 0.0000 0.0000
210 0.0000 0.0000 0.0000
215 0.0000 0.0000 0.0000
220 0.0000 0.0000 0.0000
225 0.0000 0.0000 0.0000
230 0.0000 0.0000 0.0000
235 0.0000 0.0000 0.0000
240 0.0000 0.0000 0.0000
245 0.0000 0.0000 0.0000
250 0.0000 0.0000 0.0000
255 0.0000 0.0000 0.0000
260 0.0000 0.0000 0.0000
265 0.0000 0.0000 0.0000
270 0.0000 0.0000 0.0000
275 0.0000 0.0000 0.0000
280 0.0000 0.0000 0.0000
285 0.0000 0.0000 0.0000
290 0.0000 0.0000 0.0000
295 0.0000 0.0000 0.0000
300 0.0000 0.0000 0.0000
305 0.0000 0.0000 0.0000
310 0.0000 0.0000 0.0000
315 0.0000 0.0000 0.0000
320 0.0000 0.0000 0.0000
325 0.0000 0.0000 0.0000
330 0.0000 0.0000 0.0000
335 0.0000 0.0000 0.0000
340 0.0000 0.0000 0.0000
345 0.0000 0.0000 0.0000
350 0.0000 0.0000 0.0000
355 0.0000 0.0000 0.0000
360 0.0000 0.0000 0.0000
365 0.0000 0.0000 0.0000
370 0.0000 0.0000 0.0000
375 0.0000 0.0000 0.0000
380 0.0000 0.0000 0.0000
385 0.0000 0.0000 0.0000
390 0.0000 0.0000 0.0000
395 0.0000 0.0000 0.0000
400 0.0000 0.0000 0.0000
405 0.0000 0.0000 0.0000
410 0.0000 0.0000 0.0000
415 0.0000 0.0000 0.0000
420 0.0000 0.0000 0.0000
425 0.0000 0.0000 0.0000
430 0.0000 0.0000 0.0000
435 0.0000 0.0000 0.0000
440 0.0000 0.0000 0.0000
445 0.0000 0.0000 0.0000
450 0.0000 0.0000 0.0000
455 0.0000 0.0000 0.0000
460 0.0000 0.0000 0.0000
465 0.0000 0.0000 0.0000
470 0.0000 0.0000 0.0000
475 0.0000 0.0000 0.0000
480 0.0000 0.0000 0.0000
485 0.0000 0.0000 0.0000
490 0.0000 0.0000 0.0000
495 0.0000 0.0000 0.0000
500 0.0000 0.0000 0.0000
505 0.0000 0.0000 0.0000
510 0.0000 0.0000 0.0000
515 0.0000 0.0000 0.0000
520 0.0000 0.0000 0.0000
525 0.0000 0.0000 0.0000
530 0.0000 0.0000 0.0000
535 0.0000 0.0000 0.0000
540 0.0000 0.0000 0.0000
545 0.0000 0.0000 0.0000
550 0.0000 0.0000 0.0000
555 0.0000 0.0000 0.0000
560 0.0000 0.0000 0.0000
565 0.0000 0.0000 0.0000
570 0.0000 0.0000 0.0000
575 0.0000 0.0000 0.0000
580 0.0000 0.0000 0.0000
585 0.0000 0.0000 0.0000
590 0.0000 0.0000 0.0000
595 0.0000 0.0000 0.0000
600 0.0000 0.0000 0.0000
605 0.0000 0.0000 0.0000
610 0.0000 0.0000 0.0000
615 0.0000 0.0000 0.0000
620 0.0000 0.0000 0.0000
625 0.0000 0.0000 0.0000
630 0.0000 0.0000 0.0000
635 0.0000 0.0000 0.0000
640 0.0000 0.0000 0.0000
645 0.0000 0.0000 0.0000
650 0.0000 0.0000 0.0000
655 0.0000 0.0000 0.0000
660 0.0000 0.0000 0.0000
665 0.0000 0.0000 0.0000
670 0.0000 0.0000 0.0000
675 0.0000 0.0000 0.0000
680 0.0000 0.0000 0.0000
685 0.0000 0.0000 0.0000
690 0.0000 0.0000 0.0000
695 0.0000 0.0000 0.0000
700 0.0000 0.0000 0.0000
705 0.0000 0.0000 0.0000
710 0.0000 0.0000 0.0000
715 0.0000 0.0000 0.0000
720 0.0000 0.0000 0.0000
725 0.0000 0.0000 0.0000
730 0.0000 0.0000 0.0000
735 0.0000 0.0000 0.0000
740 0.0000 0.0000 0.0000
745 0.0000 0.0000 0.0000
750 0.0000 0.0000 0.0000
755 0.0000 0.0000 0.0000
760 0.0000 0.0000 0.0000
765 0.0000 0.0000 0.0000
770 0.0000 0.0000 0.0000
775 0.0000 0.0000 0.0000
780 0.0000 0.0000 0.0000
785 0.0000 0.0000 0.0000
790 0.0000 0.0000 0.0000
795 0.0000 0.0000 0.0000
800 0.0000 0.0000 0.0000
805 0.0000 0.0000 0.0000
810 0.0000 0.0000 0.0000
815 0.0000 0.0000 0.0000
820 0.0000 0.0000 0.0000
825 0.0000 0.0000 0.0000
830 0.0000 0.0000 0.0000
835 0.0000 0.0000 0.0000
840 0.0000 0.0000 0.0000
845 0.0000 0.0000 0.0000
850 0.0000 0.0000 0.0000
855 0.0000 0.0000 0.0000
860 0.0000 0.0000 0.0000
865 0.0000 0.0000 0.0000
870 0.0000 0.0000 0.0000
875 0.0000 0.0000 0.0000
880 0.0000 0.0000 0.0000
885 0.0000 0.0000 0.0000
890 0.0000 0.0000 0.0000
895 0.0000 0.0000 0.0000
900 0.0000 0.0000 0.0000
905 0.0000 0.0000 0.0000
910 0.0000 0.0000 0.0000
915 0.0000 0.0000 0.0000
920 0.0000 0.0000 0.0000
925 0.0000 0.0000 0.0000
930 0.0000 0.0000 0.0000
935 0.0000 0.0000 0.0000
940 0.0000 0.0000 0.0000
945 0.0000 0.0000 0.0000
950 0.0000 0.0000 0.0000
955 0.0000 0.0000 0.0000
960 0.0000 0.0000 0.0000
965 0.0000 0.0000 0.0000
970 0.0000 0.0000 0.0000
975 0.0000 0.0000 0.0000
980 0.0000 0.0000 0.0000
985 0.0000 0.0000 0.0000
990 0.0000 0.0000 0.0000
995 0.0000 0.0000 0.0000
1000 0.0000 0.0000 0.0000

```



DUAL #26  
PASSIVE  
ATCRBS  
100,20 equivalent



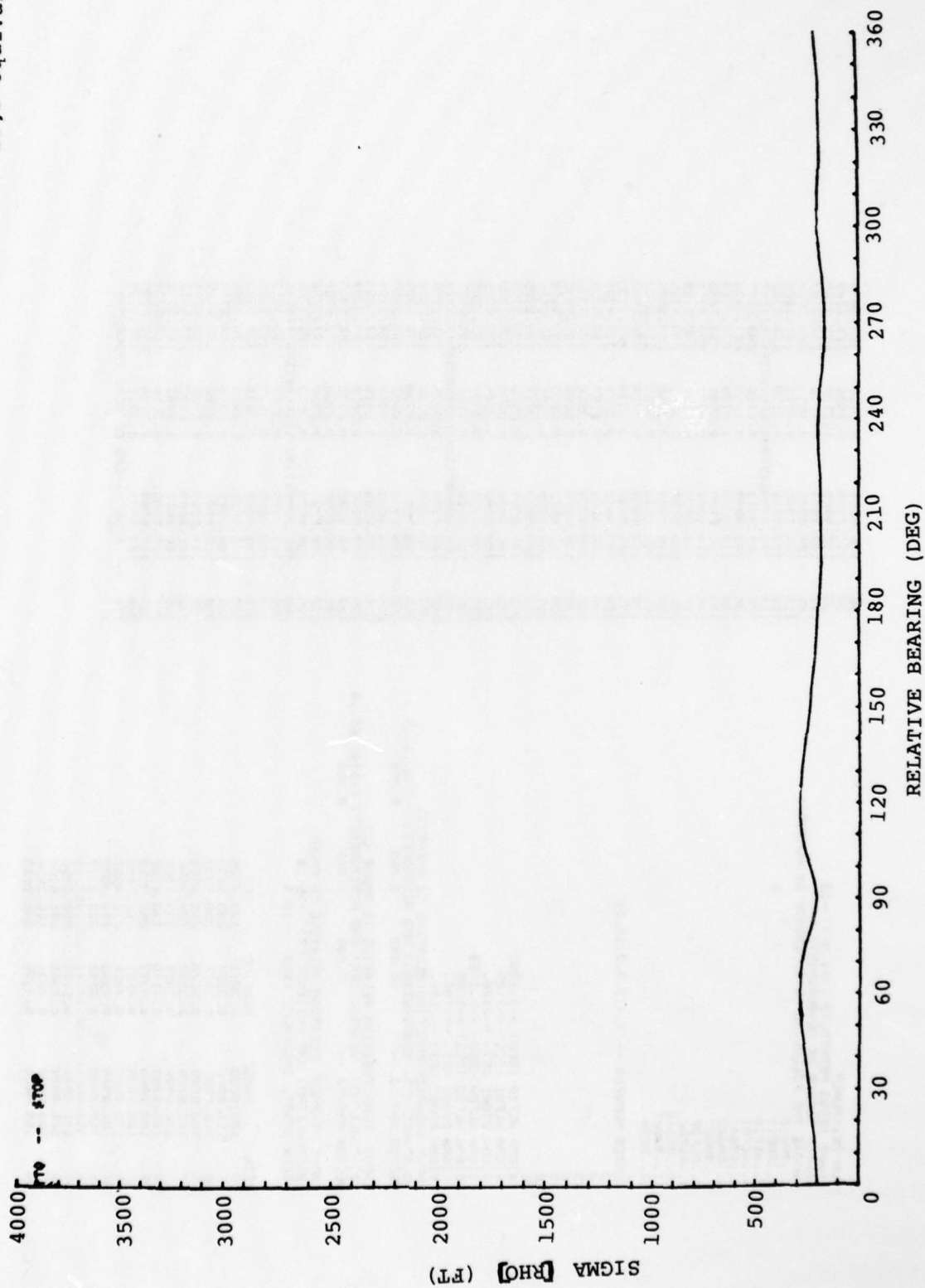


```

*MAIN PROGRAM
*WANT NEED PRINTOUTS (Y=1,N=2) -->
*ENTER NUMBER OF MEASUREMENTS --> 6
*CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO:0
2..RHO:1
3..ALF:0
4..ALF:1
5..DT0:1
6..RHO:0
7..RHO:1
8..ALF:0
9..ALF:1
10..DT0:2
11..DT0:1
12..BETA
ENTER NUMBERS --> 3,4,5,8,9,10
3
4
5
6
7
8
9
10
11
12
SIGMA ALF:0 (DEG) --> 1.768
SIGMA ALF:1 (DEG) --> 1.25
SIGMA DT0:1 (FT) --> 100
SIGMA DT0:2 (DEG) --> 1.768
SIGMA ALF:0 (DEG) --> 1.25
SIGMA DT0:2 (FT) --> 100
INPUT RADAR:1 POSITION RELATIVE TO RADAR(1)
DISTANCE(NM), BEARING(DEG) AND HEIGHT(FT) --> 100.000 0.000 0.000
VECTOR RHO:12 --> 100.000 0.000 0.000
INPUT COUNT POSITION RELATIVE TO RADAR(1)
DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) --> 100.000 0.000 0.000
VECTOR RHO:10 --> 50.000 50.000 50.000
INPUT (TARGET) POSITION RELATIVE TO COUNT
DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) --> 20.000 0.000 0.000
BETA START, INCREMENT (DEG) --> 0.5
BETA RANGE BEARING CEP
0 533.1904 0.3548 914.6487
1 481.3277 0.3548 884.2585
2 459.8444 0.3471 852.5283
3 439.2300 0.3425 819.5097
4 420.6328 0.3376 786.5191
5 403.6418 0.3315 749.5125
6 388.1925 0.3248 713.4923
7 374.2836 0.3188 675.5234
8 361.9836 0.3124 639.1354
9 351.2836 0.3058 601.7580
10 342.0770 0.2984 564.8545
11 334.3770 0.2911 528.9535
12 328.0770 0.2837 493.5535
13 323.1770 0.2763 459.1535
14 319.6770 0.2689 425.3535
15 317.4770 0.2615 391.5535
16 316.4770 0.2541 358.1535
17 316.5770 0.2467 324.7535
18 317.7770 0.2393 291.9535
19 320.0770 0.2319 259.1535
20 323.4770 0.2245 226.3535
21 327.9770 0.2171 193.5535
22 333.5770 0.2097 160.7535
23 340.2770 0.2023 127.9535
24 348.0770 0.1949 95.1535
25 356.9770 0.1875 62.3535
26 366.9770 0.1801 29.5535
27 378.0770 0.1727 0.0000
28 389.2770 0.1653 0.0000
29 400.5770 0.1579 0.0000
30 411.9770 0.1505 0.0000
31 423.4770 0.1431 0.0000
32 435.0770 0.1357 0.0000
33 446.7770 0.1283 0.0000
34 458.5770 0.1209 0.0000
35 470.4770 0.1135 0.0000
36 482.4770 0.1061 0.0000
37 494.5770 0.0987 0.0000
38 506.7770 0.0913 0.0000
39 519.0770 0.0839 0.0000
40 531.4770 0.0765 0.0000
41 543.9770 0.0691 0.0000
42 556.5770 0.0617 0.0000
43 569.2770 0.0543 0.0000
44 582.0770 0.0469 0.0000
45 594.9770 0.0395 0.0000
46 607.9770 0.0321 0.0000
47 621.0770 0.0247 0.0000
48 634.2770 0.0173 0.0000
49 647.5770 0.0099 0.0000
50 660.9770 0.0025 0.0000
51 674.4770 0.0000 0.0000
52 688.0770 0.0000 0.0000
53 701.7770 0.0000 0.0000
54 715.5770 0.0000 0.0000
55 729.4770 0.0000 0.0000
56 743.4770 0.0000 0.0000
57 757.5770 0.0000 0.0000
58 771.7770 0.0000 0.0000
59 786.0770 0.0000 0.0000
60 800.4770 0.0000 0.0000
61 814.9770 0.0000 0.0000
62 829.5770 0.0000 0.0000
63 844.2770 0.0000 0.0000
64 859.0770 0.0000 0.0000
65 873.9770 0.0000 0.0000
66 888.9770 0.0000 0.0000
67 904.0770 0.0000 0.0000
68 919.2770 0.0000 0.0000
69 934.5770 0.0000 0.0000
70 949.9770 0.0000 0.0000
71 965.4770 0.0000 0.0000
72 981.0770 0.0000 0.0000
73 996.7770 0.0000 0.0000
74 1012.5770 0.0000 0.0000
75 1028.4770 0.0000 0.0000
76 1044.4770 0.0000 0.0000
77 1060.5770 0.0000 0.0000
78 1076.7770 0.0000 0.0000
79 1093.0770 0.0000 0.0000
80 1109.4770 0.0000 0.0000
81 1125.9770 0.0000 0.0000
82 1142.5770 0.0000 0.0000
83 1159.2770 0.0000 0.0000
84 1176.0770 0.0000 0.0000
85 1192.9770 0.0000 0.0000
86 1209.9770 0.0000 0.0000
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89 1261.5770 0.0000 0.0000
90 1278.9770 0.0000 0.0000
91 1296.4770 0.0000 0.0000
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93 1331.7770 0.0000 0.0000
94 1349.5770 0.0000 0.0000
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124 1929.9770 0.0000 0.0000
125 1950.7770 0.0000 0.0000
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127 1992.6770 0.0000 0.0000
128 2013.7770 0.0000 0.0000
129 2034.9770 0.0000 0.0000
130 2056.2770 0.0000 0.0000
131 2077.6770 0.0000 0.0000
132 2099.1770 0.0000 0.0000
133 2120.7770 0.0000 0.0000
134 2142.4770 0.0000 0.0000
135 2164.2770 0.0000 0.0000
136 2186.1770 0.0000 0.0000
137 2208.1770 0.0000 0.0000
138 2230.2770 0.0000 0.0000
139 2252.4770 0.0000 0.0000
140 2274.7770 0.0000 0.0000
141 2297.1770 0.0000 0.0000
142 2319.6770 0.0000 0.0000
143 2342.2770 0.0000 0.0000
144 2364.9770 0.0000 0.0000
145 2387.7770 0.0000 0.0000
146 2410.6770 0.0000 0.0000
147 2433.6770 0.0000 0.0000
148 2456.7770 0.0000 0.0000
149 2479.9770 0.0000 0.0000
150 2503.2770 0.0000 0.0000
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153 2573.7770 0.0000 0.0000
154 2597.4770 0.0000 0.0000
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156 2645.1770 0.0000 0.0000
157 2669.1770 0.0000 0.0000
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169 2964.9770 0.0000 0.0000
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195 3656.2770 0.0000 0.0000
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197 3712.1770 0.0000 0.0000
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199 3768.4770 0.0000 0.0000
200 3796.7770 0.0000 0.0000
201 3825.1770 0.0000 0.0000
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203 3882.2770 0.0000 0.0000
204 3910.9770 0.0000 0.0000
205 3939.7770 0.0000 0.0000
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224 4505.9770 0.0000 0.0000
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228 4629.7770 0.0000 0.0000
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237 4914.1770 0.0000 0.0000
238 4946.2770 0.0000 0.0000
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245 5173.7770 0.0000 0.0000
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406 10668.8770 0.0000 0.0000
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409 10771.4770 0.0000 0.0000
410 10805.6770 0.0000 0.0000
411 10839.8770 0.0000 0.0000
412 10874.0770 0.0000 0.0000
413 10908.2770 0.0000 0.0000
414 10942.4770 0.0000 0.0000
415 10976.6770 0.0000 0.0000
416 11010.8770 0.0000 0.0000
417 11045.0770 0.0000 0.0000
418 11079.2770 0.0000 0.0000
419 11113.4770 0.0000 0.0000
420 11147.6770 0.0000 0.0000
421 11181.8770 0.0000 0.0000
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423 11250.2770 0.0000 0.0000
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42
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DUAL #26  
SEMI-ACTIVE  
ATCRBS  
10,5 equivalent

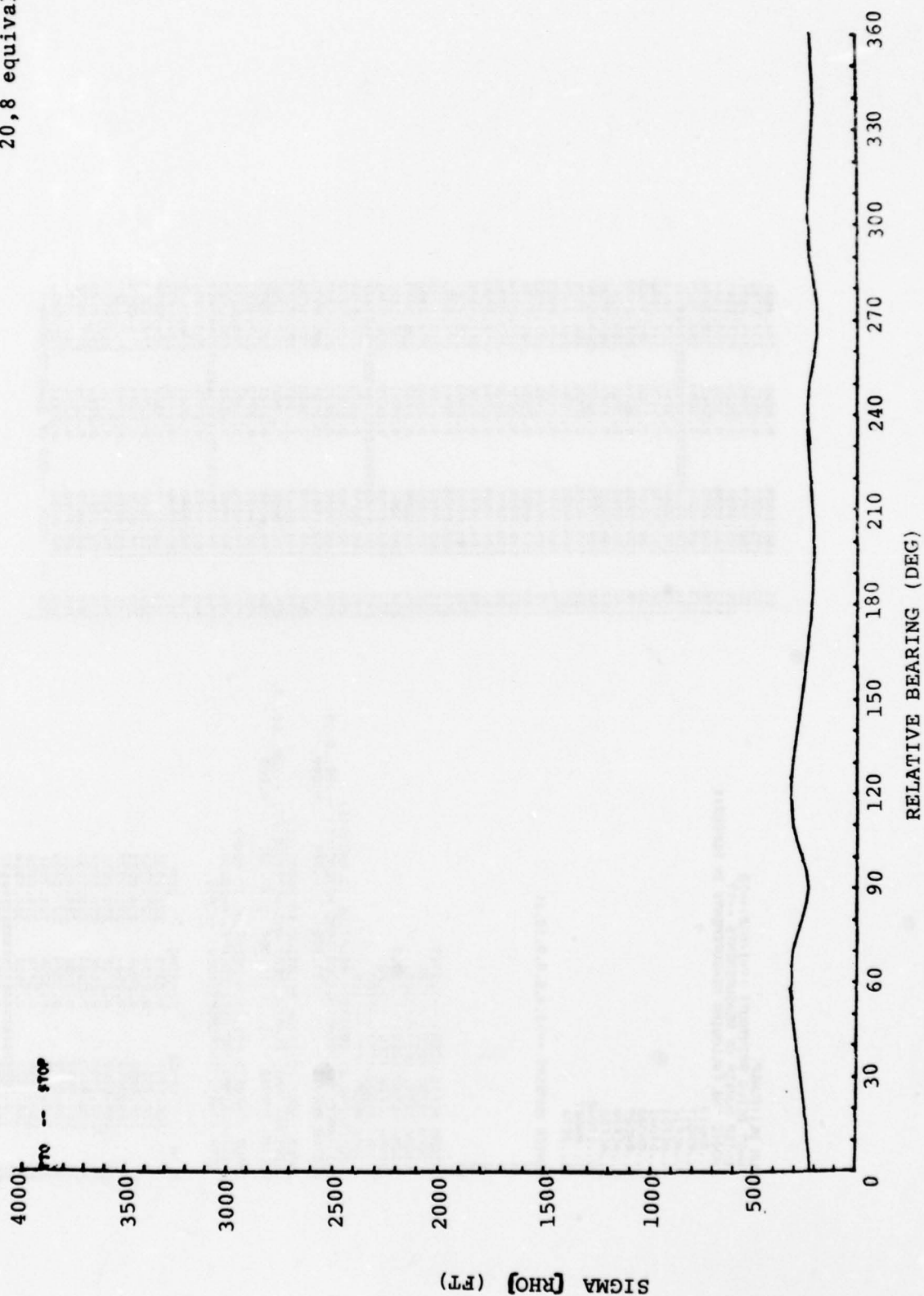








DUAL #26  
SEMI-ACTIVE  
ATCRBS  
20,8 equivalent

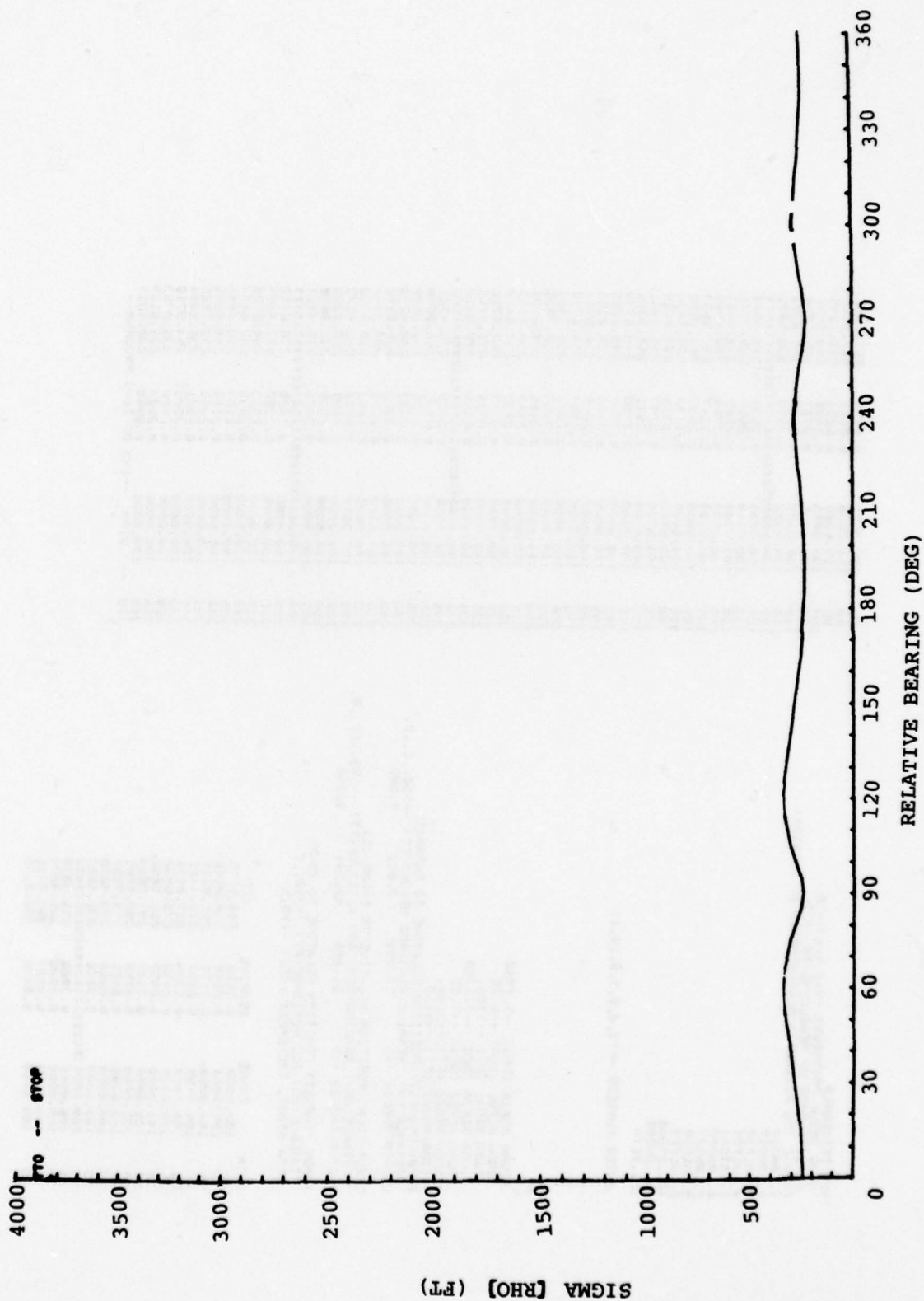








DUAL #26  
SEMI-ACTIVE  
ATCRBS  
50,10 equivalent





```

*NON DELTA MAINP
*UNIT MEAS. PRINTOUTS (V.I.N.B.)-->2
*ENTER NUMBER OF MEASUREMENTS -->7
*CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO11
3..ALF10
4..ALF11
5..DT011
6..DT012
7..RHO20
8..RHO21
9..ALF20
10..ALF21
11..DT020
12..BETA
ENTER NUMBERS -->3,4,5,8,9,10,11

11 SIGMA ALF10 (DEG) --> 1765
SIGMA ALF11 (DEG) --> 15
SIGMA DT011 (FT) --> 1045
SIGMA ALF20 (DEG) --> 165
SIGMA ALF21 (DEG) --> 15
SIGMA DT020 (FT) --> 104.
SIGMA RHO20 (FT) --> 104.
INPUT RANGE(1) POSITION RELATIVE TO RADAR (1)
DISTANCE(M), BEARING(DEG) AND HEIGHT(FT) -->50.0..0.0
VECTOR RHO12 --> 50.000 0.000 0.000
INPUT (COUNT) POSITION RELATIVE TO RADAR (1)
DISTANCE(M), BEARING(DEG) AND ALTITUDE(FT) -->50.00..0.0
VECTOR RHO10 --> 25.000 43.301 0.000
INPUT (TARGET) POSITION RELATIVE TO COUNT
DISTANCE(M), BEARING(DEG) AND ALTITUDE(FT) -->10..0.0
BETA START, INCREMENT (DEG) -->10.5

BETA RANGE BEARING CEP
0 100.0000 240.1215
5 100.0000 0.0000 244.8945
10 100.0000 0.0198 251.0386
15 100.0000 0.0171 258.4481
20 100.0000 0.0133 266.8838
25 100.0000 0.0113 275.3524
30 100.0000 0.0097 283.8497
35 100.0000 0.0085 292.3799
40 100.0000 0.0075 300.9472
45 100.0000 0.0065 309.5565
50 100.0000 0.0058 318.2122
55 100.0000 0.0050 326.9187
60 100.0000 0.0043 335.6723
65 100.0000 0.0038 344.4789
70 100.0000 0.0032 353.3345
75 100.0000 0.0027 362.2459
80 100.0000 0.0022 371.2187

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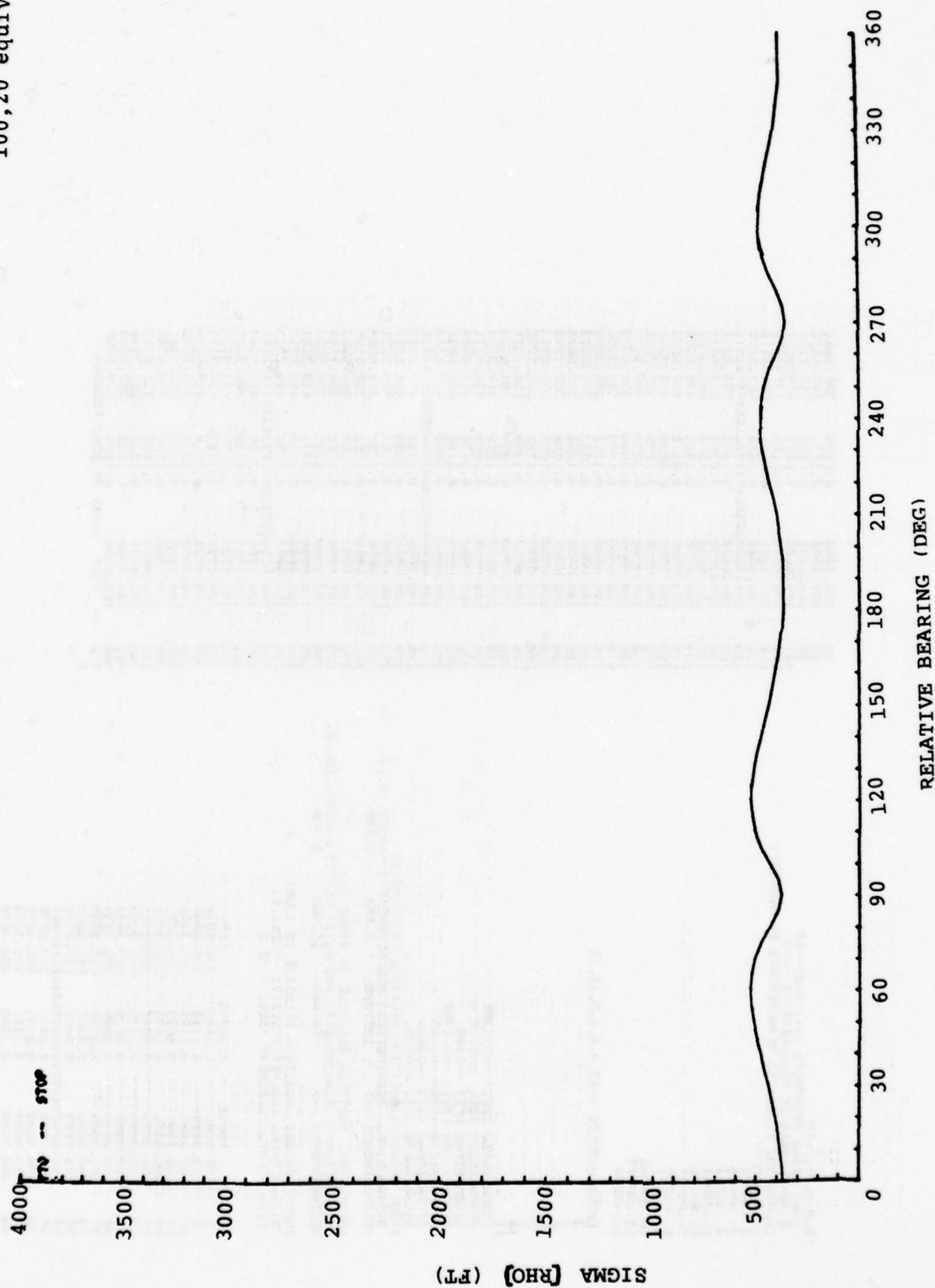
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85 100.0000 0.0018 380.2589
90 100.0000 0.0014 389.3899
95 100.0000 0.0011 398.6274
100 100.0000 0.0008 407.9674
105 100.0000 0.0006 417.4059
110 100.0000 0.0004 426.9389
115 100.0000 0.0003 436.5624
120 100.0000 0.0002 446.2724
125 100.0000 0.0001 456.0649
130 100.0000 0.0000 465.9349
135 100.0000 0.0000 475.8784
140 100.0000 0.0000 485.8919
145 100.0000 0.0000 495.9714
150 100.0000 0.0000 506.1149
155 100.0000 0.0000 516.3184
160 100.0000 0.0000 526.5809
165 100.0000 0.0000 536.8994
170 100.0000 0.0000 547.2719
175 100.0000 0.0000 557.6954
180 100.0000 0.0000 568.1679
185 100.0000 0.0000 578.6864
190 100.0000 0.0000 589.2489
195 100.0000 0.0000 599.8624
200 100.0000 0.0000 610.5249
205 100.0000 0.0000 621.2334
210 100.0000 0.0000 631.9859
215 100.0000 0.0000 642.7804
220 100.0000 0.0000 653.6149
225 100.0000 0.0000 664.4864
230 100.0000 0.0000 675.3919
235 100.0000 0.0000 686.3284
240 100.0000 0.0000 697.2939
245 100.0000 0.0000 708.2854
250 100.0000 0.0000 719.3009
255 100.0000 0.0000 730.3384
260 100.0000 0.0000 741.3959
265 100.0000 0.0000 752.4714
270 100.0000 0.0000 763.5629
275 100.0000 0.0000 774.6674
280 100.0000 0.0000 785.7919
285 100.0000 0.0000 796.9324
290 100.0000 0.0000 808.0869
295 100.0000 0.0000 819.2614
300 100.0000 0.0000 830.4539
305 100.0000 0.0000 841.6714
310 100.0000 0.0000 852.9119
315 100.0000 0.0000 864.1724
320 100.0000 0.0000 875.4509
325 100.0000 0.0000 886.7444
330 100.0000 0.0000 898.0609
335 100.0000 0.0000 909.3974
340 100.0000 0.0000 920.7519
345 100.0000 0.0000 932.1214
350 100.0000 0.0000 943.5039
355 100.0000 0.0000 954.8964
360 100.0000 0.0000 966.3069
365 100.0000 0.0000 977.7314
370 100.0000 0.0000 989.1679
375 100.0000 0.0000 1000.6224
380 100.0000 0.0000 1012.0929
385 100.0000 0.0000 1023.5764
390 100.0000 0.0000 1035.0709
395 100.0000 0.0000 1046.5834
400 100.0000 0.0000 1058.1119
405 100.0000 0.0000 1069.6524
410 100.0000 0.0000 1081.2039
415 100.0000 0.0000 1092.7734
420 100.0000 0.0000 1104.3589
425 100.0000 0.0000 1115.9574
430 100.0000 0.0000 1127.5669
435 100.0000 0.0000 1139.1854
440 100.0000 0.0000 1150.8119
445 100.0000 0.0000 1162.4434
450 100.0000 0.0000 1174.0889
455 100.0000 0.0000 1185.7454
460 100.0000 0.0000 1197.4119
465 100.0000 0.0000 1209.0864
470 100.0000 0.0000 1220.7679
475 100.0000 0.0000 1232.4634
480 100.0000 0.0000 1244.1719
485 100.0000 0.0000 1255.8904
490 100.0000 0.0000 1267.6169
495 100.0000 0.0000 1279.3584
500 100.0000 0.0000 1291.1139
505 100.0000 0.0000 1302.8814
510 100.0000 0.0000 1314.6599
515 100.0000 0.0000 1326.4464
520 100.0000 0.0000 1338.2409
525 100.0000 0.0000 1349.9414
530 100.0000 0.0000 1361.6459
535 100.0000 0.0000 1373.3614
540 100.0000 0.0000 1385.0869
545 100.0000 0.0000 1396.8214
550 100.0000 0.0000 1408.5639
555 100.0000 0.0000 1420.3114
560 100.0000 0.0000 1432.0629
565 100.0000 0.0000 1443.8264
570 100.0000 0.0000 1455.5999
575 100.0000 0.0000 1467.3814
580 100.0000 0.0000 1479.1699
585 100.0000 0.0000 1490.9734
590 100.0000 0.0000 1502.7909
595 100.0000 0.0000 1514.6194
600 100.0000 0.0000 1526.4579
605 100.0000 0.0000 1538.3034
610 100.0000 0.0000 1550.1549
615 100.0000 0.0000 1562.0114
620 100.0000 0.0000 1573.8719
625 100.0000 0.0000 1585.7344
630 100.0000 0.0000 1597.5969
635 100.0000 0.0000 1609.4664
640 100.0000 0.0000 1621.3419
645 100.0000 0.0000 1633.2214
650 100.0000 0.0000 1645.1039
655 100.0000 0.0000 1656.9864
660 100.0000 0.0000 1668.8689
665 100.0000 0.0000 1680.7514
670 100.0000 0.0000 1692.6329
675 100.0000 0.0000 1704.5114
680 100.0000 0.0000 1716.3869
685 100.0000 0.0000 1728.2664
690 100.0000 0.0000 1740.1479
695 100.0000 0.0000 1752.0284
700 100.0000 0.0000 1763.9069
705 100.0000 0.0000 1775.7814
710 100.0000 0.0000 1787.6519
715 100.0000 0.0000 1799.5164
720 100.0000 0.0000 1811.3829
725 100.0000 0.0000 1823.2484
730 100.0000 0.0000 1835.1119
735 100.0000 0.0000 1846.9714
740 100.0000 0.0000 1858.8269
745 100.0000 0.0000 1870.6764
750 100.0000 0.0000 1882.5189
755 100.0000 0.0000 1894.3614
760 100.0000 0.0000 1906.2029
765 100.0000 0.0000 1918.0414
770 100.0000 0.0000 1929.8759
775 100.0000 0.0000 1941.7134
780 100.0000 0.0000 1953.5529
785 100.0000 0.0000 1965.3924
790 100.0000 0.0000 1977.2309
795 100.0000 0.0000 1989.0664
800 100.0000 0.0000 2000.9009
805 100.0000 0.0000 2012.7314
810 100.0000 0.0000 2024.5569
815 100.0000 0.0000 2036.3834
820 100.0000 0.0000 2048.2089
825 100.0000 0.0000 2060.0314
830 100.0000 0.0000 2071.8509
835 100.0000 0.0000 2083.6654
840 100.0000 0.0000 2095.4739
845 100.0000 0.0000 2107.2834
850 100.0000 0.0000 2119.0899
855 100.0000 0.0000 2130.8914
860 100.0000 0.0000 2142.6869
865 100.0000 0.0000 2154.4834
870 100.0000 0.0000 2166.2789
875 100.0000 0.0000 2178.0714
880 100.0000 0.0000 2189.8609
885 100.0000 0.0000 2201.6454
890 100.0000 0.0000 2213.4239
895 100.0000 0.0000 2225.2034
900 100.0000 0.0000 2236.9739
905 100.0000 0.0000 2248.7414
910 100.0000 0.0000 2260.5039
915 100.0000 0.0000 2272.2614
920 100.0000 0.0000 2284.0139
925 100.0000 0.0000 2295.7614
930 100.0000 0.0000 2307.5039
935 100.0000 0.0000 2319.2414
940 100.0000 0.0000 2330.9739
945 100.0000 0.0000 2342.7014
950 100.0000 0.0000 2354.4239
955 100.0000 0.0000 2366.1414
960 100.0000 0.0000 2377.8539
965 100.0000 0.0000 2389.5614
970 100.0000 0.0000 2401.2639
975 100.0000 0.0000 2412.9614
980 100.0000 0.0000 2424.6539
985 100.0000 0.0000 2436.3414
990 100.0000 0.0000 2448.0239
995 100.0000 0.0000 2459.7014
1000 100.0000 0.0000 2471.3739

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DUAL #26  
SEMI-ACTIVE  
ATCRBS  
100,20 equivalent





```

NEW PULL-UP
WAIT 1000 PRINTOUTS (N-1,N-2)---2
ENTER NUMBER OF MEASUREMENTS ---7
CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO15
3..ALF10
4..ALF15
5..DTOM1
6..RHO20
7..RHO25
8..ALF20
9..ALF25
10..DTOM2
11..RHO2T
12..BETA

ENTER NUMBERS -->3,4,5,8,9,10,11
3
4
5
6
7
8
9
10
11
SIGMA ALF10 (DEG) -->.1768
SIGMA ALF15 (DEG) -->.25
SIGMA DTOM1 (FT) -->100.
SIGMA ALF20 (DEG) -->.1768
SIGMA ALF25 (DEG) -->.25
SIGMA DTOM2 (FT) -->100.
SIGMA RHO2T (FT) -->100.
INPUT RADAR(2) POSITION RELATIVE TO RADAR(1)
DISTANCE(M), BEARING(DEG) AND HEIGHT(FT) -->100.,0.,0.
VECTOR RHO012 --> 100.000 0.000 0.000

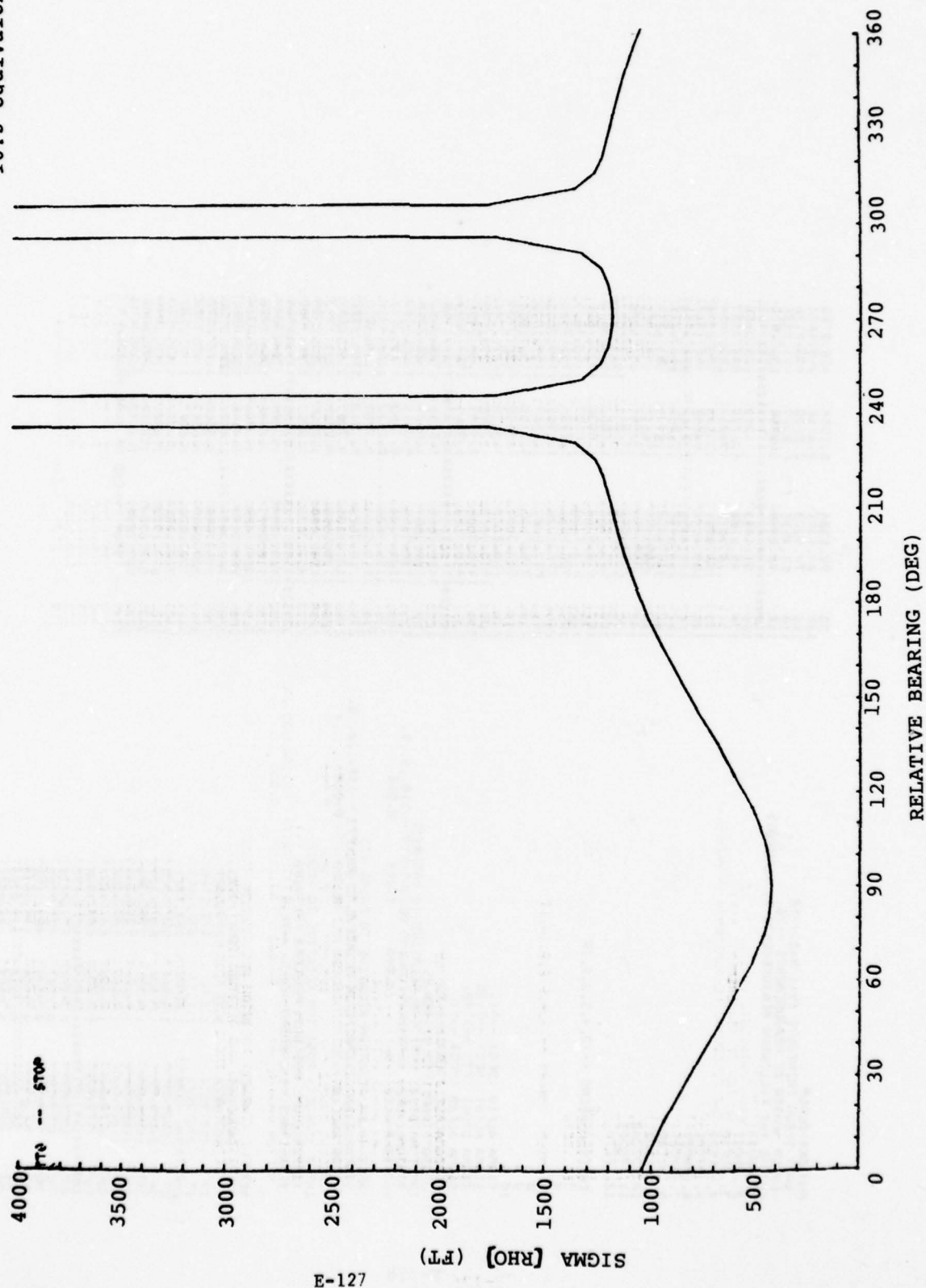
INPUT (3,4,5) POSITION RELATIVE TO RADAR(1)
DISTANCE(M), BEARING(DEG) AND ALTITUDE(FT) -->100.,00.,0.
VECTOR RHO010 --> 50.000 85.003 0.000

INPUT (7,8,9) POSITION RELATIVE TO (3,4,5)
DISTANCE(M) AND ALTITUDE(FT) -->20.,0.
BETA START, INCREMENT (DEG) -->.5

BETA RANGE BEARING CEP
0 100.0000 0.1683 370.5902
5 100.0000 0.1712 376.6000
10 100.0000 0.1755 385.3456
15 100.0000 0.1809 396.5479
20 100.0000 0.1874 409.9421
25 100.0000 0.1948 425.2265
30 100.0000 0.2030 442.6309
35 100.0000 0.2116 462.1423
40 100.0000 0.2208 482.8323
45 100.0000 0.2305 503.6324
50 100.0000 0.2407 523.2708
55 100.0000 0.2423 531.5524
60 100.0000 0.2424 523.8170
65 100.0000 0.2424 506.4579
70 100.0000 0.2341 475.3250
75 100.0000 0.2101 434.4570
80 100.0000 0.1903 396.5154
85 100.0000 0.1731 366.4236
90 100.0000 0.1600 346.5154
95 100.0000 0.1503 334.4570
100 100.0000 0.1441 326.4579
105 100.0000 0.1401 320.4579
110 100.0000 0.1374 316.4579
115 100.0000 0.1358 313.4579
120 100.0000 0.1350 311.4579
125 100.0000 0.1350 310.4579
130 100.0000 0.1358 310.4579
135 100.0000 0.1374 311.4579
140 100.0000 0.1401 316.4579
145 100.0000 0.1441 326.4579
150 100.0000 0.1503 334.4579
155 100.0000 0.1574 346.4579
160 100.0000 0.1650 366.4579
165 100.0000 0.1731 386.4579
170 100.0000 0.1816 406.4579
175 100.0000 0.1903 426.4579
180 100.0000 0.1993 446.4579
185 100.0000 0.2086 466.4579
190 100.0000 0.2181 486.4579
195 100.0000 0.2278 506.4579
200 100.0000 0.2377 526.4579
205 100.0000 0.2477 546.4579
210 100.0000 0.2577 566.4579
215 100.0000 0.2677 586.4579
220 100.0000 0.2777 606.4579
225 100.0000 0.2877 626.4579
230 100.0000 0.2977 646.4579
235 100.0000 0.3077 666.4579
240 100.0000 0.3177 686.4579
245 100.0000 0.3277 706.4579
250 100.0000 0.3377 726.4579
255 100.0000 0.3477 746.4579
260 100.0000 0.3577 766.4579
265 100.0000 0.3677 786.4579
270 100.0000 0.3777 806.4579
275 100.0000 0.3877 826.4579
280 100.0000 0.3977 846.4579
285 100.0000 0.4077 866.4579
290 100.0000 0.4177 886.4579
295 100.0000 0.4277 906.4579
300 100.0000 0.4377 926.4579
305 100.0000 0.4477 946.4579
310 100.0000 0.4577 966.4579
315 100.0000 0.4677 986.4579
320 100.0000 0.4777 1006.4579
325 100.0000 0.4877 1026.4579
330 100.0000 0.4977 1046.4579
335 100.0000 0.5077 1066.4579
340 100.0000 0.5177 1086.4579
345 100.0000 0.5277 1106.4579
350 100.0000 0.5377 1126.4579
355 100.0000 0.5477 1146.4579
360 100.0000 0.5577 1166.4579
365 100.0000 0.5677 1186.4579
370 100.0000 0.5777 1206.4579
375 100.0000 0.5877 1226.4579
380 100.0000 0.5977 1246.4579
385 100.0000 0.6077 1266.4579
390 100.0000 0.6177 1286.4579
395 100.0000 0.6277 1306.4579
400 100.0000 0.6377 1326.4579
405 100.0000 0.6477 1346.4579
410 100.0000 0.6577 1366.4579
415 100.0000 0.6677 1386.4579
420 100.0000 0.6777 1406.4579
425 100.0000 0.6877 1426.4579
430 100.0000 0.6977 1446.4579
435 100.0000 0.7077 1466.4579
440 100.0000 0.7177 1486.4579
445 100.0000 0.7277 1506.4579
450 100.0000 0.7377 1526.4579
455 100.0000 0.7477 1546.4579
460 100.0000 0.7577 1566.4579
465 100.0000 0.7677 1586.4579
470 100.0000 0.7777 1606.4579
475 100.0000 0.7877 1626.4579
480 100.0000 0.7977 1646.4579
485 100.0000 0.8077 1666.4579
490 100.0000 0.8177 1686.4579
495 100.0000 0.8277 1706.4579
500 100.0000 0.8377 1726.4579
505 100.0000 0.8477 1746.4579
510 100.0000 0.8577 1766.4579
515 100.0000 0.8677 1786.4579
520 100.0000 0.8777 1806.4579
525 100.0000 0.8877 1826.4579
530 100.0000 0.8977 1846.4579
535 100.0000 0.9077 1866.4579
540 100.0000 0.9177 1886.4579
545 100.0000 0.9277 1906.4579
550 100.0000 0.9377 1926.4579
555 100.0000 0.9477 1946.4579
560 100.0000 0.9577 1966.4579
565 100.0000 0.9677 1986.4579
570 100.0000 0.9777 2006.4579
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580 100.0000 0.9977 2046.4579
585 100.0000 1.0077 2066.4579
590 100.0000 1.0177 2086.4579
595 100.0000 1.0277 2106.4579
600 100.0000 1.0377 2126.4579
605 100.0000 1.0477 2146.4579
610 100.0000 1.0577 2166.4579
615 100.0000 1.0677 2186.4579
620 100.0000 1.0777 2206.4579
625 100.0000 1.0877 2226.4579
630 100.0000 1.0977 2246.4579
635 100.0000 1.1077 2266.4579
640 100.0000 1.1177 2286.4579
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650 100.0000 1.1377 2326.4579
655 100.0000 1.1477 2346.4579
660 100.0000 1.1577 2366.4579
665 100.0000 1.1677 2386.4579
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805 100.0000 1.4477 2946.4579
810 100.0000 1.4577 2966.4579
815 100.0000 1.4677 2986.4579
820 100.0000 1.4777 3006.4579
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830 100.0000 1.4977 3046.4579
835 100.0000 1.5077 3066.4579
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850 100.0000 1.5377 3126.4579
855 100.0000 1.5477 3146.4579
860 100.0000 1.5577 3166.4579
865 100.0000 1.5677 3186.4579
870 100.0000 1.5777 3206.4579
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880 100.0000 1.5977 3246.4579
885 100.0000 1.6077 3266.4579
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900 100.0000 1.6377 3326.4579
905 100.0000 1.6477 3346.4579
910 100.0000 1.6577 3366.4579
915 100.0000 1.6677 3386.4579
920 100.0000 1.6777 3406.4579
925 100.0000 1.6877 3426.4579
930 100.0000 1.6977 3446.4579
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940 100.0000 1.7177 3486.4579
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950 100.0000 1.7377 3526.4579
955 100.0000 1.7477 3546.4579
960 100.0000 1.7577 3566.4579
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975 100.0000 1.7877 3626.4579
980 100.0000 1.7977 3646.4579
985 100.0000 1.8077 3666.4579
990 100.0000 1.8177 3686.4579
995 100.0000 1.8277 3706.4579
1000 100.0000 1.8377 3726.4579
1005 100.0000 1.8477 3746.4579
1010 100.0000 1.8577 3766.4579
1015 100.0000 1.8677 3786.4579
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1030 100.0000 1.8977 3846.4579
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1065 100.0000 1.9677 3986.4579
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1075 100.0000 1.9877 4026.4579
1080 100.0000 1.9977 4046.4579
1085 100.0000 2.0077 4066.4579
1090 100.0000 2.0177 4086.4579
1095 100.0000 2.0277 4106.4579
1100 100.0000 2.0377 4126.4579
1105 100.0000 2.0477 4146.4579
1110 100.0000 2.0577 4166.4579
1115 100.0000 2.0677 4186.4579
1120 100.0000 2.0777 4206.4579
1125 100.0000 2.0877 4226.4579
1130 100.0000 2.0977 4246.4579
1135 100.0000 2.1077 4266.4579
1140 100.0000 2.1177 4286.4579
1145 100.0000 2.1277 4306.4579
1150 100.0000 2.1377 4326.4579
1155 100.0000 2.1477 4346.4579
1160 100.0000 2.1577 4366.4579
1165 100.0000 2.1677 4386.4579
1170 100.0000 2.1777 4406.4579
1175 100.0000 2.1877 4426.4579
1180 100.0000 2.1977 4446.4579
1185 100.0000 2.2077 4466.4579
1190 100.0000 2.2177 4486.4579
1195 100.0000 2.2277 4506.4579
1200 100.0000 2.2377 4526.4579
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1210 100.0000 2.2577 4566.4579
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1250 100.0000 2.3377 4726.4579
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1265 100.0000 2.3677 4786.4579
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1275 100.0000 2.3877 4826.4579
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1310 100.0000 2.4577 4966.4579
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1330 100.0000 2.4977 5046.4579
1335 100.0000 2.5077 5066.4579
1340 100.0000 2.5177 5086.4579
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1355 100.0000 2.5477 5146.4579
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1390 100.0000 2.6177 5286.4579
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1410 100.0000 2.6577 5366.4579
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1420 100.0000 2.6777 5406.4579
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1470 100.0000 2.7777 5606.4579
1475 100.0000 2.7877 5626.4579
1480 100.0000 2.7977 5646.4579
1485 100.0000 2.8077 5666.4579
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1495 100.0000 2.8277 5706.4579
1500 100.0000 2.8377 5726.4579
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1515 100.0000 2.8677 5786.4579
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1530 100.0000 2.8977 5846.4579
1535 100.0000 2.9077 5866.4579
1540 100.0000 2.9177 5886.4579
1545 100.0000 2.9277 5906.4579
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1565 100.0000 2.9677 5986.4579
1570 100.0000 2.9777 6006.4579
1575 100.0000 2.9877 6026.4579
1580 100.0000 2.9977 6046.4579
1585 100.0000 3.0077 6066.4579
1590 100.0000 3.0177 6086.4579
1595 100.0000 3.0277 6106.4579
1600 100.0000 3.0377 6126.4579
1605 100.0000 3.0477 6146.4579
1610 100.0000 3.0577 6166.4579
1615 100.0000 3.0677 6186.4579
1620 100.0000 3.0777 6206.4579
1625 100.0000 3.0877 6226.4579
1630 100.0000 3.0977 6246.4579
1635 100.0000 3.1077 6266.4579
1640 100.0000 3.1177 6286.4579
1645 100.0000 3.1277 6306.4579
1650 100.0000 3.1377 6326.4579
1655 100.0000 3.1477 6346.4579
1660 100.0000 3.1577 6366.4579
1665 100.0000 3.1677 6386.4579
1670 100.0000 3.1777 6406.4579
1675 100.0000 3.1877 6426.4579
1680 100.0000 3.1977 6446.4579
1685 100.0000 3.2077 6466.4579
1690 100.0000 3.2177 6486.4579
1695 100.0000 3.2277 6506.4579
1700 100.0000 3.2377 6526.4579
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1710 100.0000 3.2577 6566.4579
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1730 100.0000 3.2977 6646.4579
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1765 100.0000 3.3677 6786.4579
1770 100.0000 3.3777 6806.4579
1775 100.0000 3.3877 6826.4579
1780 100.0000 3.3977 6846.4579
1785 100.0000 3.4077 6866.4579
1790 100.0000 3.4177 6886.4579
1795 100.0000 3.4277 6906.4579
1800 100.0000 3.4377 6926.4579
1805 100.0000 3.4477 6946.4579
1810 100.0000 3.4577 6966.4579
1815 100.0000 3.4677 6986.4579
1820 100.0000 3.4777 7006.4579
1825 100.0000 3.4877 7026.4579
1830 100.0000 3.4977 7046.4579
1835 100.0000 3.5077 7066.4579
1840 100.0000 3.5177 7086.4579
1845 100.0000 3.5277 7106.4579
1850 100.0000 3.5377 7126.4579
1855 100.0000 3.5477 7146.4579
1860 100.0000 3.5577 7166.4579
1865 100.0000 3.5677 7186.4579
1870 100.0000 3.5777 7206.4579
1875 100.0000 3.5877 7226.4579
1880 100.0000 3.5977 7246.4579
1885 100.0000 3.6077 7266.4579
1890 100.0000 3.6177 7286.4579
1895 100.0000 3.6277 7306.4579
1900 100.0000 3.6377 7326.4579
1905 100.0000 3.6477 7346.4579
1910 100.0000 3.6577 7366.4579
1915 100.0000 3.6677 7386.4579
1920 100.0000 3.6777 7406.4579
1925 100.0000 3.6877 7426.4579
1930 100.0000 3.6977 7446.4579
1935 100.0000 3.7077 7466.4579
1940 100.0000 3.7177 7486.4579
1945 100.0000 3.7277 7506.4579
1950 100.0000 3.7377 7526.4579
1955 
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PASSIVE DUAL #26  
with Directional Antenna  
with 10 error  
ATCRBS  
10.5 equivalent





PIN INDIVIDUAL  
 UNIT DEUG PRINTOUTS (Y=1,N=2)-->2  
 ENTER NUMBER OF MEASUREMENTS -->6  
 CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:1

1..RHO10  
 2..RHO11  
 3..ALF10  
 4..ALF11  
 5..DTOM1  
 6..RHO20  
 7..RHO21  
 8..ALF20  
 9..ALF21  
 10..DTOM2  
 11..RHOOT  
 12..BETA

ENTER NUMBERS -->3,4,5,8,9,10

3  
 4  
 5  
 8  
 9  
 10  
 SIGMA ALF10 (DEG) -->1.  
 SIGMA ALF11 (DEG) -->.25  
 SIGMA DTOM1 (FT) -->100.  
 SIGMA ALF20 (DEG) -->1.  
 SIGMA ALF21 (DEG) -->.25  
 SIGMA DTOM2 (FT) -->100.  
 INPUT RADAR(2) POSITION RELATIVE TO RADAR(1)  
 DISTANCE(NM), BEARING(DEG) AND HEIGHT(FT) -->10.,.0.,.0.  
 VECTOR RHO12 --> 10.000 0.000 0.000

INPUT (OWN) POSITION RELATIVE TO RADAR (1)  
 DISTANCE(NM), BEARING(DEG) AND ALTITUDE(FT) -->10.,.60.,.0.  
 VECTOR RHO10 --> 5.000 8.660 0.000  
 INPUT (TARGET) POSITION RELATIVE TO (OWN)  
 DISTANCE(NM) AND ALTITUDE(FT) -->5.,.0.  
 BETA START, INCREMENT (DEG) -->0.5

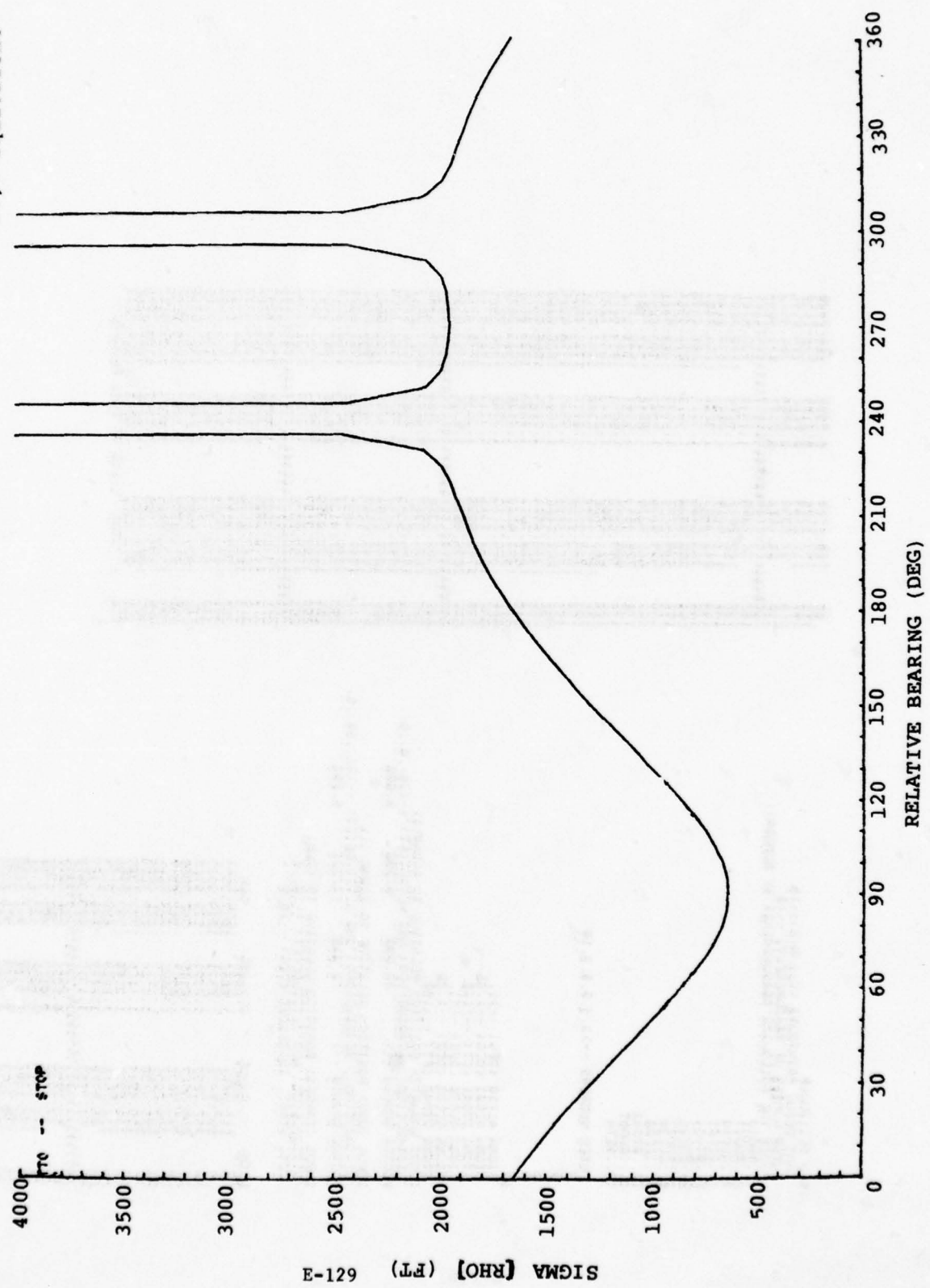
BETA	RANGE	BEARING	CEP
0	563.3666	1.6652	1047.3573
5	507.8878	1.6571	1014.9027
10	452.7237	1.6391	970.9726
15	398.3927	1.6115	942.7869
20	345.4028	1.5747	903.6014
25	294.2535	1.5294	862.7065
30	245.4438	1.4764	820.4290
35	199.4944	1.4165	777.1369
40	156.9991	1.3508	733.2498
45	118.7512	1.2804	689.2524
50	85.0700	1.2069	645.7127
55	61.6053	1.1318	603.3056
60	42.8890	1.0556	562.2839
65	34.4535	0.9797	521.7786
70	27.9283	0.8929	482.6176
75	22.2305	0.8186	444.1632
80	17.1324	0.7504	406.6750
85	12.4142	0.6807	370.6666

95	90.1784	0.7004	489.6750
100	74.3206	0.6186	448.1632
105	61.5833	0.5629	413.6176
110	51.4535	0.5197	381.7786
115	43.8890	0.4856	352.2839
120	38.3927	0.4588	325.7127
125	34.4028	1.1318	303.3056
130	31.4535	1.0556	282.2839
135	29.4438	1.0001	262.6176
140	28.2535	1.0001	244.1632
145	27.9283	1.0001	226.6750
150	28.2535	1.0001	210.1632
155	29.4438	1.0001	194.6176
160	31.4535	1.0001	180.0726
165	34.4028	1.0001	167.3573
170	38.3927	1.0001	155.4290
175	43.8890	1.0001	144.1632
180	51.4535	1.0001	134.6176
185	61.5833	1.0001	126.6750
190	74.3206	1.0001	119.1632
195	90.1784	1.0001	112.1632
200	108.1784	1.0001	105.6750
205	128.1784	1.0001	99.6176
210	149.1784	1.0001	94.0726
215	171.1784	1.0001	89.0726
220	194.1784	1.0001	84.6176
225	218.1784	1.0001	80.6750
230	243.1784	1.0001	77.2839
235	269.1784	1.0001	74.4535
240	296.1784	1.0001	72.1784
245	324.1784	1.0001	70.4535
250	353.1784	1.0001	69.2839
255	383.1784	1.0001	68.6176
260	414.1784	1.0001	68.4535
265	446.1784	1.0001	68.7869
270	479.1784	1.0001	69.6014
275	513.1784	1.0001	70.9726
280	548.1784	1.0001	72.8869
285	584.1784	1.0001	75.3573
290	621.1784	1.0001	78.3869
295	659.1784	1.0001	81.9726
300	700.1784	1.0001	86.1176
305	743.1784	1.0001	90.8290
310	788.1784	1.0001	96.1176
315	835.1784	1.0001	101.9726
320	884.1784	1.0001	108.3869
325	935.1784	1.0001	115.3573
330	988.1784	1.0001	122.8869
335	1043.1784	1.0001	130.9726
340	1099.1784	1.0001	139.6176
345	1157.1784	1.0001	148.8290
350	1217.1784	1.0001	158.6176
355	1279.1784	1.0001	168.9726
360	1343.1784	1.0001	179.9726
365	1409.1784	1.0001	191.5869
370	1477.1784	1.0001	203.8290
375	1547.1784	1.0001	216.7127
380	1619.1784	1.0001	230.2498
385	1693.1784	1.0001	244.4535
390	1769.1784	1.0001	259.3290
395	1847.1784	1.0001	274.8869
400	1927.1784	1.0001	291.1176
405	2009.1784	1.0001	308.0290
410	2093.1784	1.0001	325.6176
415	2179.1784	1.0001	343.8869
420	2267.1784	1.0001	362.8290
425	2357.1784	1.0001	382.4535
430	2449.1784	1.0001	402.7869
435	2543.1784	1.0001	423.8290
440	2639.1784	1.0001	445.5869
445	2737.1784	1.0001	468.0726
450	2837.1784	1.0001	491.2839
455	2939.1784	1.0001	515.2498
460	3043.1784	1.0001	540.0726
465	3149.1784	1.0001	565.7869
470	3257.1784	1.0001	592.3869
475	3367.1784	1.0001	619.8290
480	3479.1784	1.0001	648.1176
485	3593.1784	1.0001	677.2498
490	3709.1784	1.0001	707.2839
495	3827.1784	1.0001	738.2498
500	3947.1784	1.0001	770.1632
505	4069.1784	1.0001	803.0290
510	4193.1784	1.0001	836.8869
515	4319.1784	1.0001	871.7869
520	4447.1784	1.0001	907.7869
525	4577.1784	1.0001	944.9726
530	4709.1784	1.0001	983.3290
535	4843.1784	1.0001	1022.8869
540	4979.1784	1.0001	1063.6176
545	5117.1784	1.0001	1105.5869
550	5257.1784	1.0001	1148.8290
555	5400.1784	1.0001	1193.3869
560	5545.1784	1.0001	1239.2498
565	5693.1784	1.0001	1286.4535
570	5843.1784	1.0001	1334.9726
575	5995.1784	1.0001	1384.8290
580	6149.1784	1.0001	1435.9726
585	6305.1784	1.0001	1488.4535
590	6463.1784	1.0001	1542.2839
595	6623.1784	1.0001	1597.5869
600	6785.1784	1.0001	1654.3290
605	6949.1784	1.0001	1712.5869
610	7115.1784	1.0001	1772.3869
615	7283.1784	1.0001	1833.7869
620	7453.1784	1.0001	1896.8290
625	7625.1784	1.0001	1961.5869
630	7799.1784	1.0001	2028.0726
635	7975.1784	1.0001	2096.2839
640	8153.1784	1.0001	2166.2498
645	8333.1784	1.0001	2238.0726
650	8515.1784	1.0001	2311.7869
655	8699.1784	1.0001	2387.4535
660	8885.1784	1.0001	2465.0726
665	9073.1784	1.0001	2544.6176
670	9263.1784	1.0001	2626.1632
675	9455.1784	1.0001	2709.7869
680	9649.1784	1.0001	2795.5869
685	9845.1784	1.0001	2883.5869
690	10043.1784	1.0001	2973.8290
695	10243.1784	1.0001	3066.3869
700	10445.1784	1.0001	3161.1632
705	10649.1784	1.0001	3258.2498
710	10855.1784	1.0001	3357.6176
715	11063.1784	1.0001	3459.2839
720	11273.1784	1.0001	3563.2498
725	11485.1784	1.0001	3669.5869
730	11699.1784	1.0001	3778.2839
735	11915.1784	1.0001	3889.3869
740	12133.1784	1.0001	4002.8869
745	12353.1784	1.0001	4118.8290
750	12575.1784	1.0001	4237.2498
755	12799.1784	1.0001	4358.2839
760	13025.1784	1.0001	4481.8290
765	13253.1784	1.0001	4607.8869
770	13483.1784	1.0001	4736.4535
775	13715.1784	1.0001	4867.6176
780	13949.1784	1.0001	4991.3869
785	14185.1784	1.0001	5117.7869
790	14423.1784	1.0001	5246.8290
795	14663.1784	1.0001	5378.5869
800	14905.1784	1.0001	5513.0726
805	15149.1784	1.0001	5650.3869
810	15395.1784	1.0001	5790.5869
815	15643.1784	1.0001	5933.6176
820	15893.1784	1.0001	6079.5869
825	16145.1784	1.0001	6228.4535
830	16399.1784	1.0001	6380.2839
835	16655.1784	1.0001	6535.0726
840	16913.1784	1.0001	6692.8290
845	17173.1784	1.0001	6853.5869
850	17435.1784	1.0001	7017.3869
855	17699.1784	1.0001	7184.2839
860	17965.1784	1.0001	7354.3869
865	18233.1784	1.0001	7527.6176
870	18503.1784	1.0001	7704.0726
875	18775.1784	1.0001	7883.6176
880	19049.1784	1.0001	8066.3869
885	19325.1784	1.0001	8252.3869
890	19603.1784	1.0001	8441.6176
895	19883.1784	1.0001	8634.2839
900	20165.1784	1.0001	8830.3869
905	20449.1784	1.0001	9029.8290
910	20735.1784	1.0001	9232.6176
915	21023.1784	1.0001	9438.8290
920	21313.1784	1.0001	9648.4535
925	21605.1784	1.0001	9861.5869
930	21900.1784	1.0001	10078.2839
935	22197.1784	1.0001	10298.6176
940	22497.1784	1.0001	10522.6176
945	22799.1784	1.0001	10750.2839
950	23103.1784	1.0001	10981.6176
955	23409.1784	1.0001	11216.6176
960	23717.1784	1.0001	11455.2839
965	24027.1784	1.0001	11697.6176
970	24339.1784	1.0001	11943.6176
975	24653.1784	1.0001	12193.2839
980	24969.1784	1.0001	12446.6176
985	25287.1784	1.0001	12703.8290
990	25607.1784	1.0001	12964.8290
995	25929.1784	1.0001	13229.6176
1000	26253.1784	1.0001	13498.2839

---STOP---END OF BCAS PROGRAM---



Passive DUAL #26  
with directional Antenna  
with 10 error  
ATCRBS  
20,8 equivalent



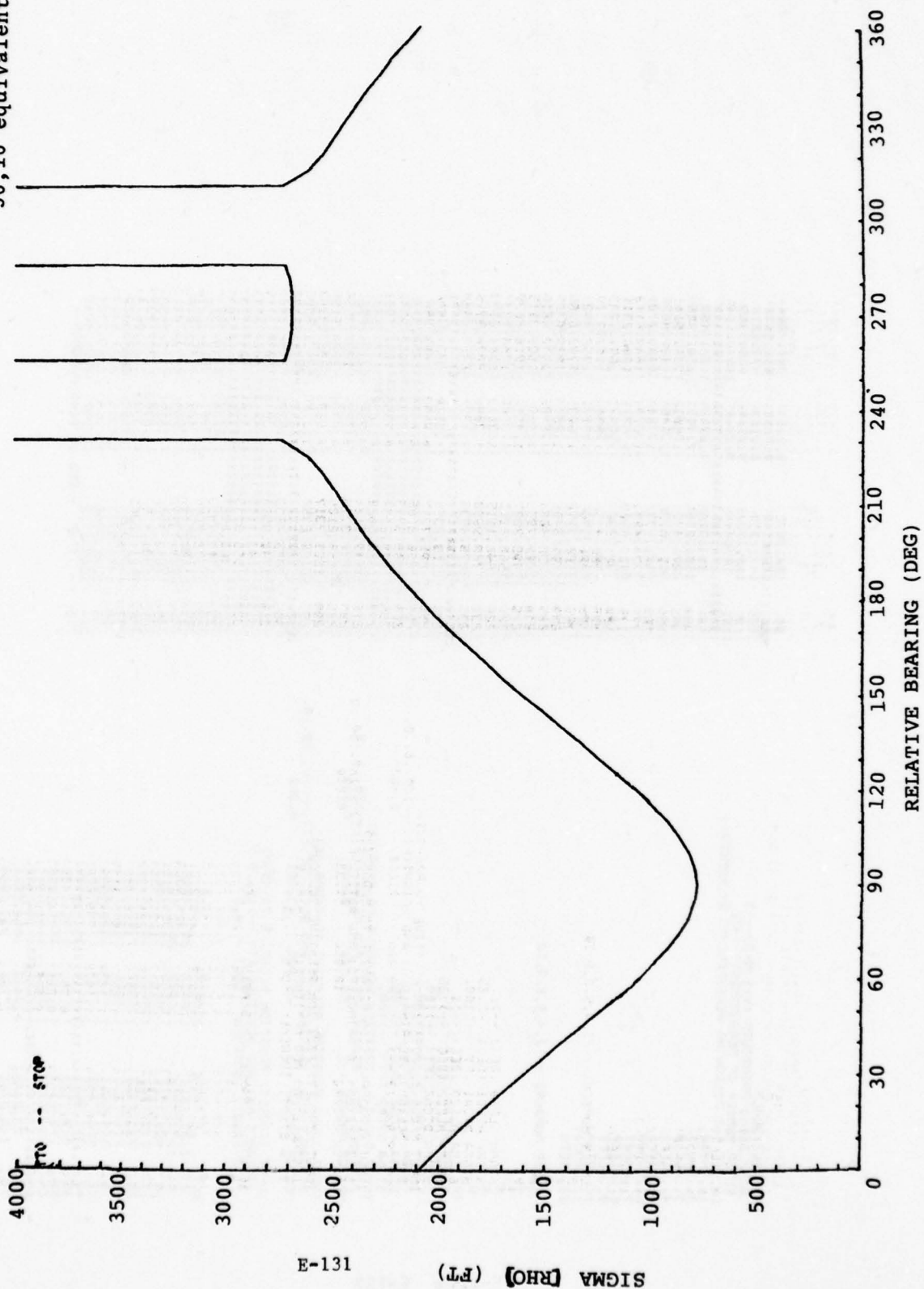


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RUN PRINTHELP
LIMIT BEING PRINTOUTS (N-1,N-2) --> 2
ENTER NUMBER OF MEASUREMENTS --> 6
ENTER THE FOLLOWING MEASUREMENTS BY NUMBER:
1...RHO1
2...RHO2
3...RHO3
4...RHO4
5...RHO5
6...RHO6
7...RHO7
8...RHO8
9...RHO9
10...RHO10
11...RHO11
12...RHO12
ENTER NUMBERS --> 3,4,5,8,9,10
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PASSIVE DUAL #26  
with Directional Ant.  
with 1° error  
ATCRBS  
50,10 equivalent



E-131

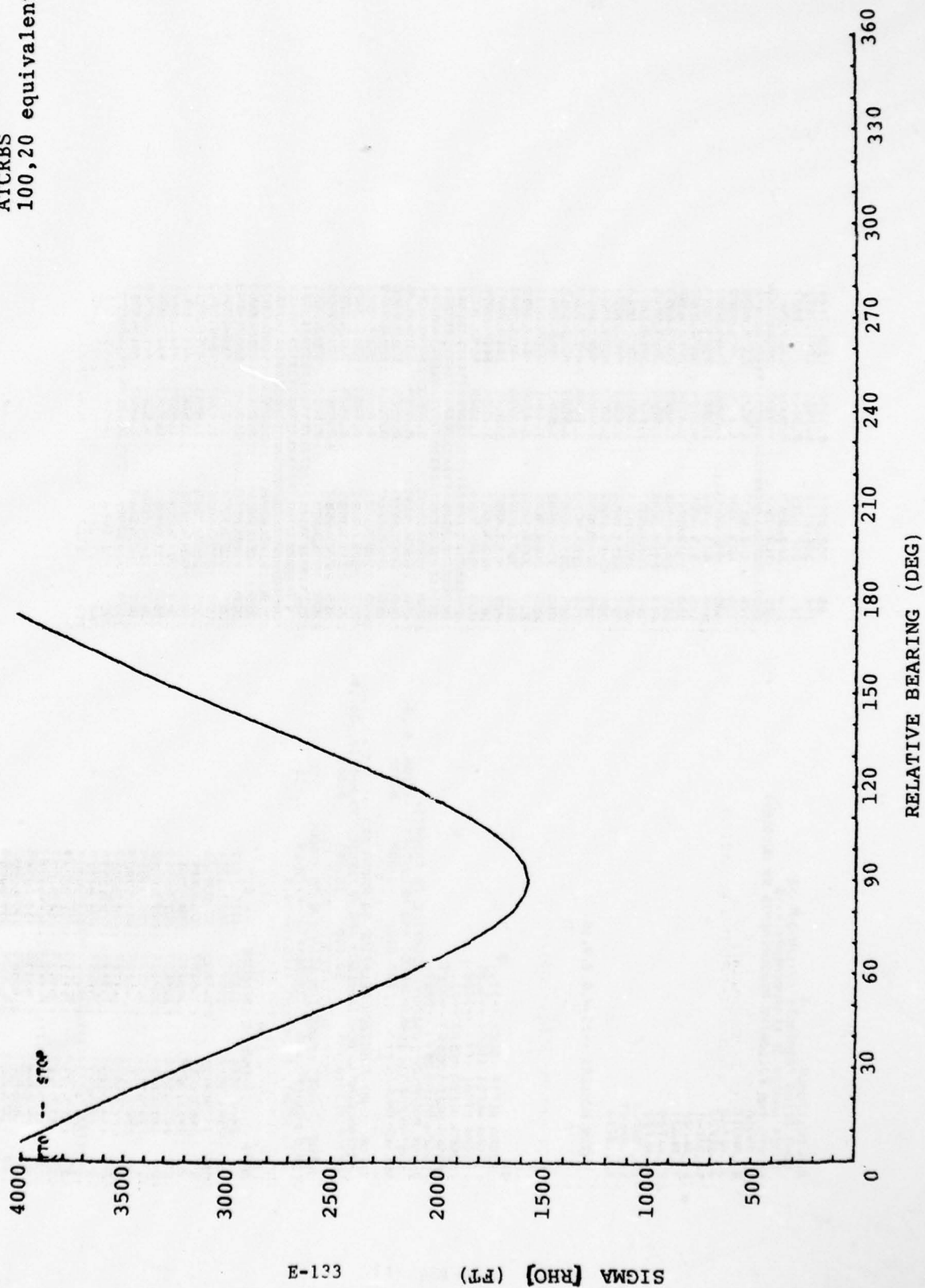


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*PUN PRINTOUTS (V-1/N-2) --2
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4..ALF12
5..ALF13
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PASSIVE DUAL #26  
 WITH DIRECTIONAL ANTENNA  
 WITH 1° ERROR  
 ATCRBS  
 100,20 equivalent





```

RUN EULIRUMLP
  UNIT DELUG PRINTOUTS (V-I/N-2) --2
  ENTER NUMBER OF MEASUREMENTS --56
  CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:
1..RHO10
2..RHO11
3..RHO12
4..ALF01
5..ALF02
6..RHO20
7..RHO21
8..ALF20
9..ALF21
10..DTOM2
11..RHO22
12..BETA

ENTER NUMBERS -->3,4,5,8,9,10
3
4
5
8
9
10
SIGMA ALF01 (DEG) -->1.
SIGMA ALF02 (DEG) -->2.25
SIGMA DTOM1 (FT) -->100.
SIGMA ALF20 (DEG) -->1.
SIGMA ALF21 (DEG) -->1.25
SIGMA DTOM2 (FT) -->100.
INPUT RADAR(2) POSITION RELATIVE TO RADAR(1)
DISTANCE (NM), BEARING (DEG) AND HEIGHT (FT) -->100.,0.,0.
VECTOR RHO12 --> 100.000 0.000 0.000

INPUT (OWN) POSITION RELATIVE TO RADAR (1)
DISTANCE (NM), BEARING (DEG) AND ALTITUDE (FT) -->100.,60.,0.
VECTOR RHO10 --> 50.000 86.603 0.000

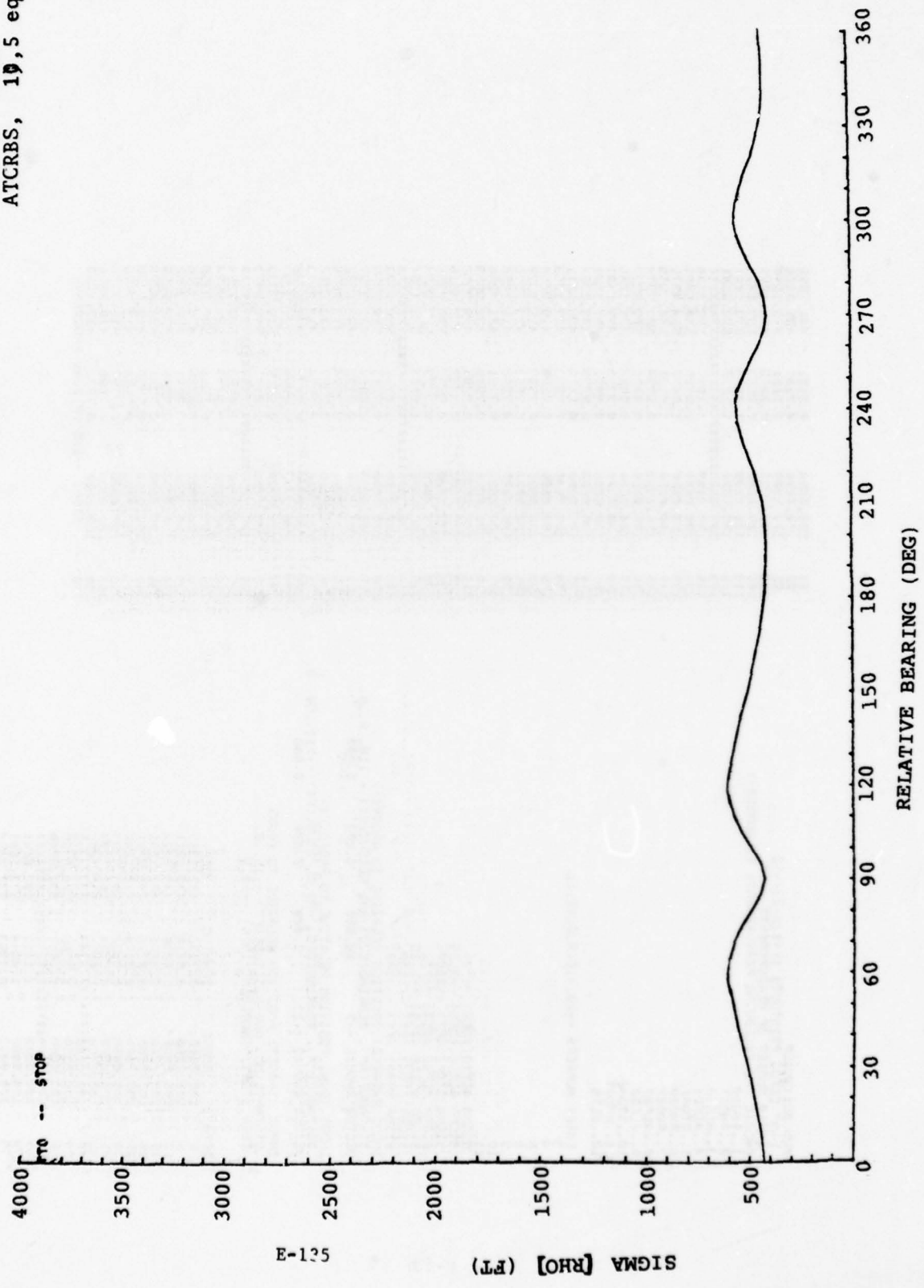
INPUT (TARGET) POSITION RELATIVE TO (OWN)
DISTANCE (NM) AND ALTITUDE (FT) -->20.,0.
BETA START, INCREMENT (DEG) -->0.5

BETA RANGE BEARING CEP
0 2405.3506 4185.6517
5 2184.9666 1.5982 4022.1224
10 1955.4174 1.5833 3870.9128
15 1659.2357 1.5587 3712.6081
20 1458.3248 1.5249 3547.9195
25 1234.5408 1.4823 3377.6953
30 1019.5794 1.4316 3202.9392
35 815.4685 1.3734 3024.8390
40 633.5751 1.3087 2844.8074
45 475.6533 1.2386 2664.5403
50 233.5636 1.1645 2486.8066
55 140.8277 1.0880 2312.0020
60 120.2923 0.2366 1990.0780
65 208.8328 0.8670 1850.7941
70 273.2922 0.8864 1733.0267
75 331.6148 0.7586 1642.7698
80 362.8382 0.7278 1585.7444
85 373.2838 0.7172 1566.2056
90

```



SEMI-ACTIVE  
DUAL #26  
WITH DIRECTIONAL ANTENNA  
WITH 1° ERROR  
ATCRBS, 19,5 equivalent



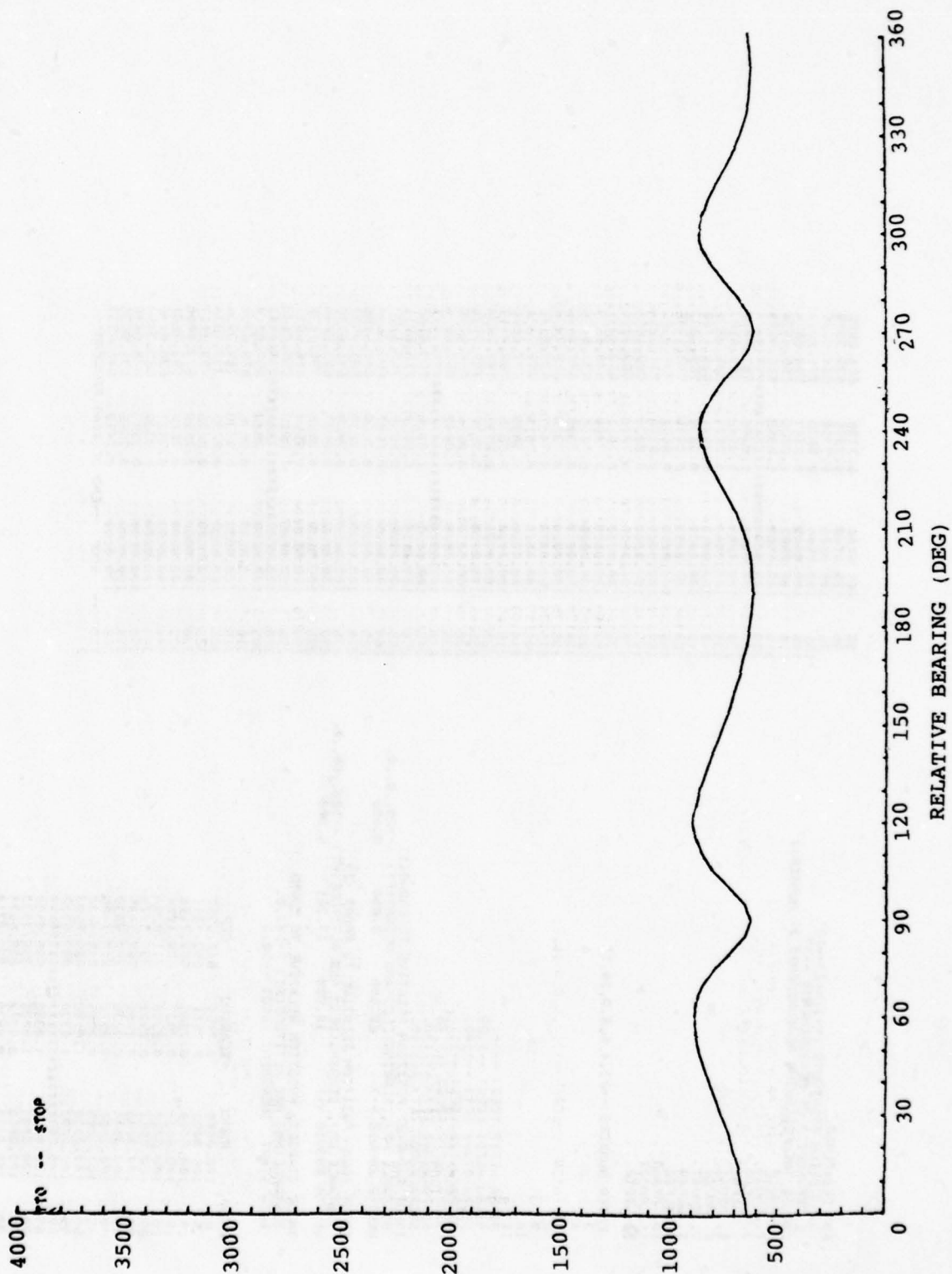
E-125







SEMI-ACTIVE  
 DUAL #26  
 with Directional Ant.  
 with 10 error  
 ATCRBS, 20,8 equivale.





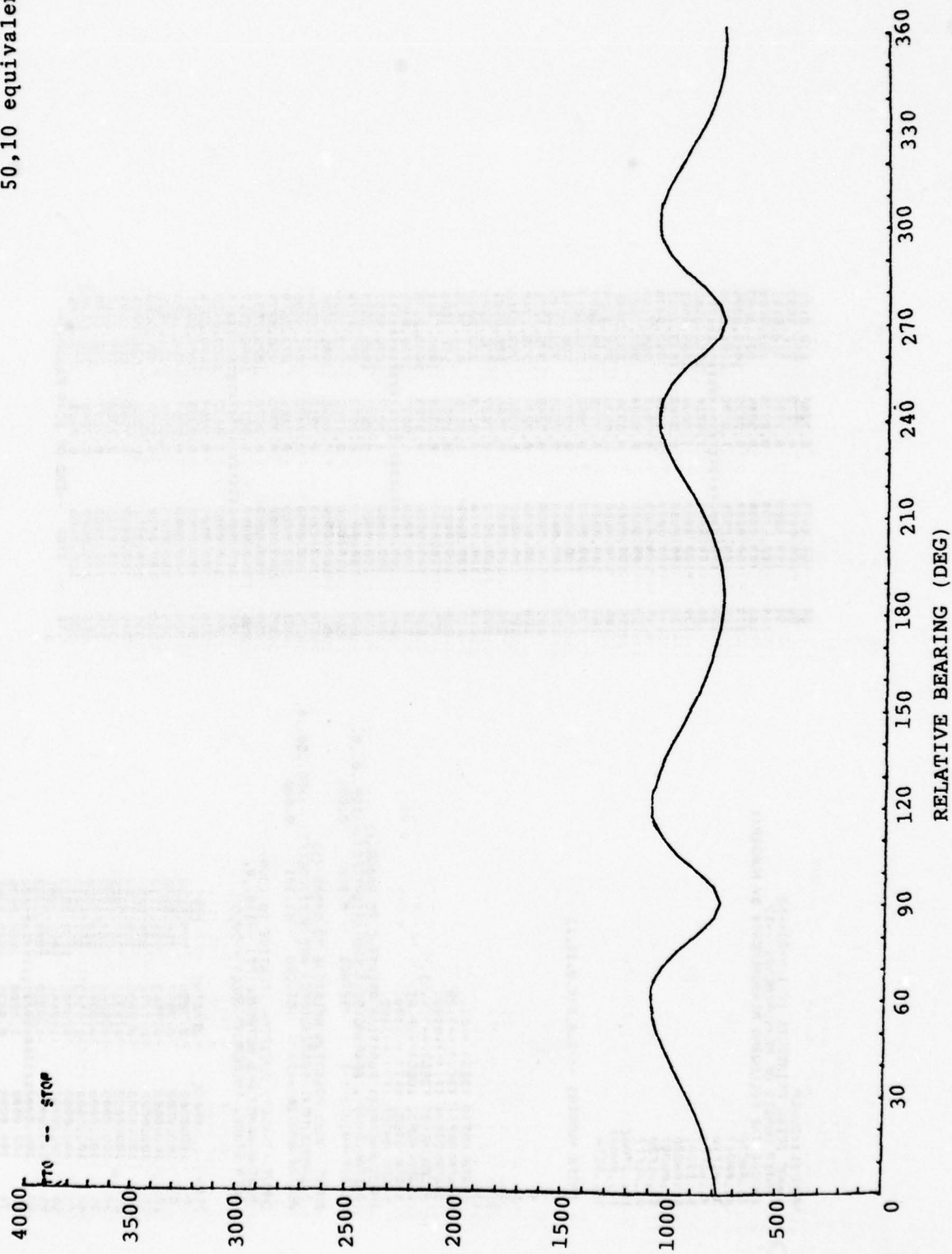
```

: PUT EDITORIALS
: UNIT DEBUG PRINTOUTS (N=1,N=2) -->2
: ENTER NUMBER OF MEASUREMENTS -->7
: CHOOSE THE FOLLOWING MEASUREMENTS BY NUMBER:1
1..RANGE
2..BEARING
3..ALF10
4..ALF20
5..ALF30
6..ALF40
7..ALF50
8..ALF60
9..ALF70
10..ALF80
11..ALF90
12..BETA
ENTER NUMBERS -->3,4,5,8,9,10,11
3
4
5
8
9
10
11
SIGMA ALF10 (DEG) -->1
SIGMA ALF20 (DEG) -->1
SIGMA ALF30 (FT) -->25
SIGMA ALF40 (DEG) -->1
SIGMA ALF50 (DEG) -->1
SIGMA ALF60 (DEG) -->25
SIGMA ALF70 (DEG) -->100
SIGMA ALF80 (FT) -->100
SIGMA ALF90 (FT) -->100
INPUT RANGE:2: POSITION RELATIVE TO RADAR<1>
DISTANCE<MI>, BEARING<DEG> AND HEIGHT<FT> -->20,0,0.
VECTOR RHOV12 --> 20.000 0.000 0.000
INPUT <GUN> POSITION RELATIVE TO RADAR <1>
DISTANCE<MI>, BEARING<DEG> AND ALTITUDE<FT> -->20,60,0.
VECTOR RHOV10 --> 10.000 17.321 0.000
INPUT <TARGET> POSITION RELATIVE TO <GUN>
DISTANCE<MI> AND ALTITUDE<FT> -->8,0.
BETA START, INCREMENT (DEG) -->0,5
BETA RANGE BEARING CEP
0 100.0000 0.7459 640.6557
5 100.0000 0.7611 653.4241
10 100.0000 0.7866 669.7196
15 100.0000 0.8037 689.1084
20 100.0000 0.8300 711.2354
25 100.0000 0.8591 735.7129
30 100.0000 0.8906 762.1445
35 100.0000 0.9236 789.9239
40 100.0000 0.9571 818.1486
45 100.0000 0.9995 845.4232
50 100.0000 1.0382 869.6193
55 100.0000 1.0926 887.6012
60 100.0000 1.1530 898.4568
65 100.0000 1.0382 886.4568
70 100.0000 1.0026 856.4830
75 100.0000 0.9387 802.6574
80 100.0000 0.8539 731.2714

```



SEMI-ACTIVE DUAL #26  
With Directional Antenna  
with 10° error  
ATCRBS  
50,10 equivalent

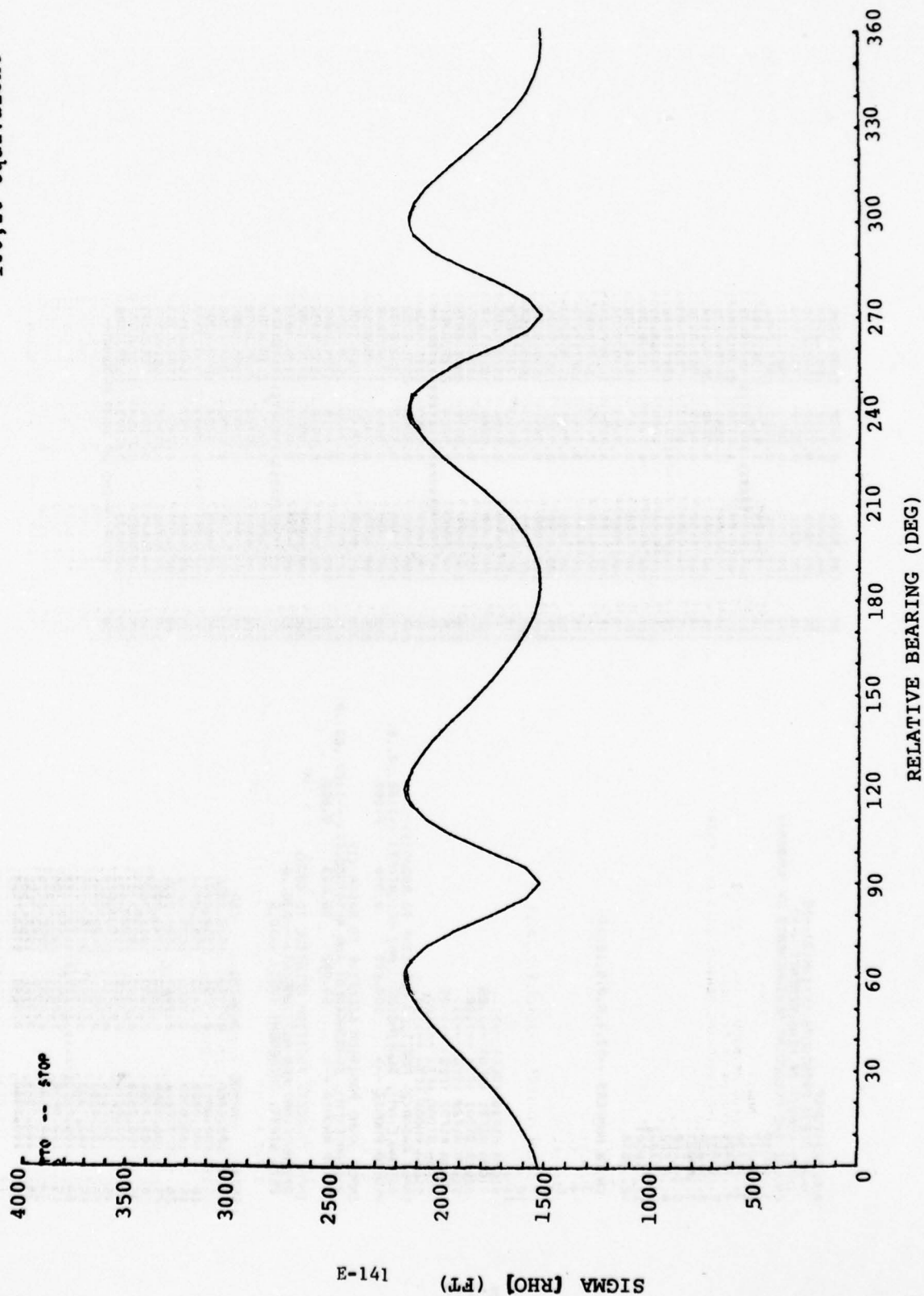








SEMI-ACTIVE  
DUAL #26 with directional ant.  
ATCRBS  
10 error Ant.  
100,20 equivalent

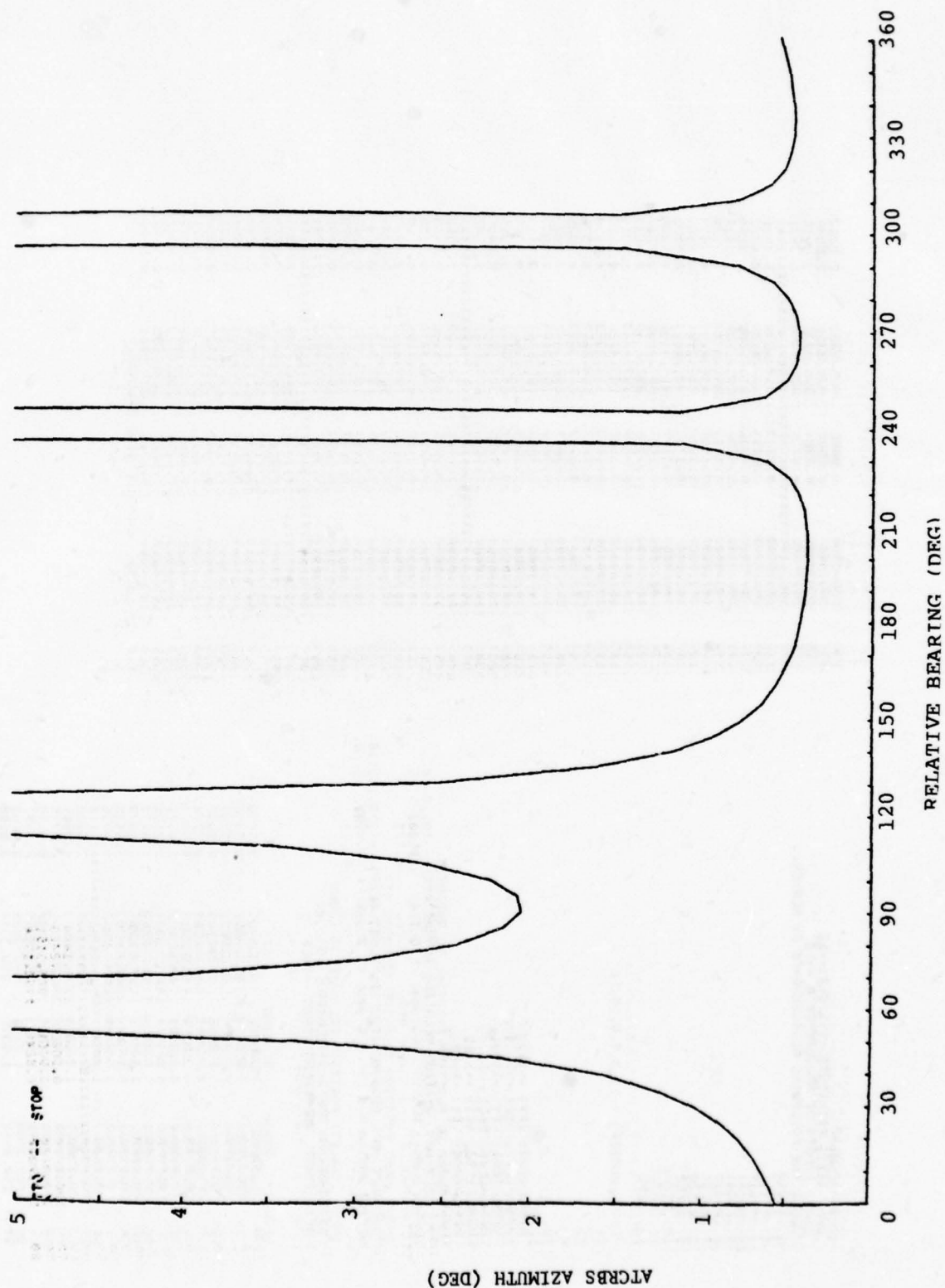








DUAL #32  
TRANSFER  
ALIGNMENT  
10,5 equivalent

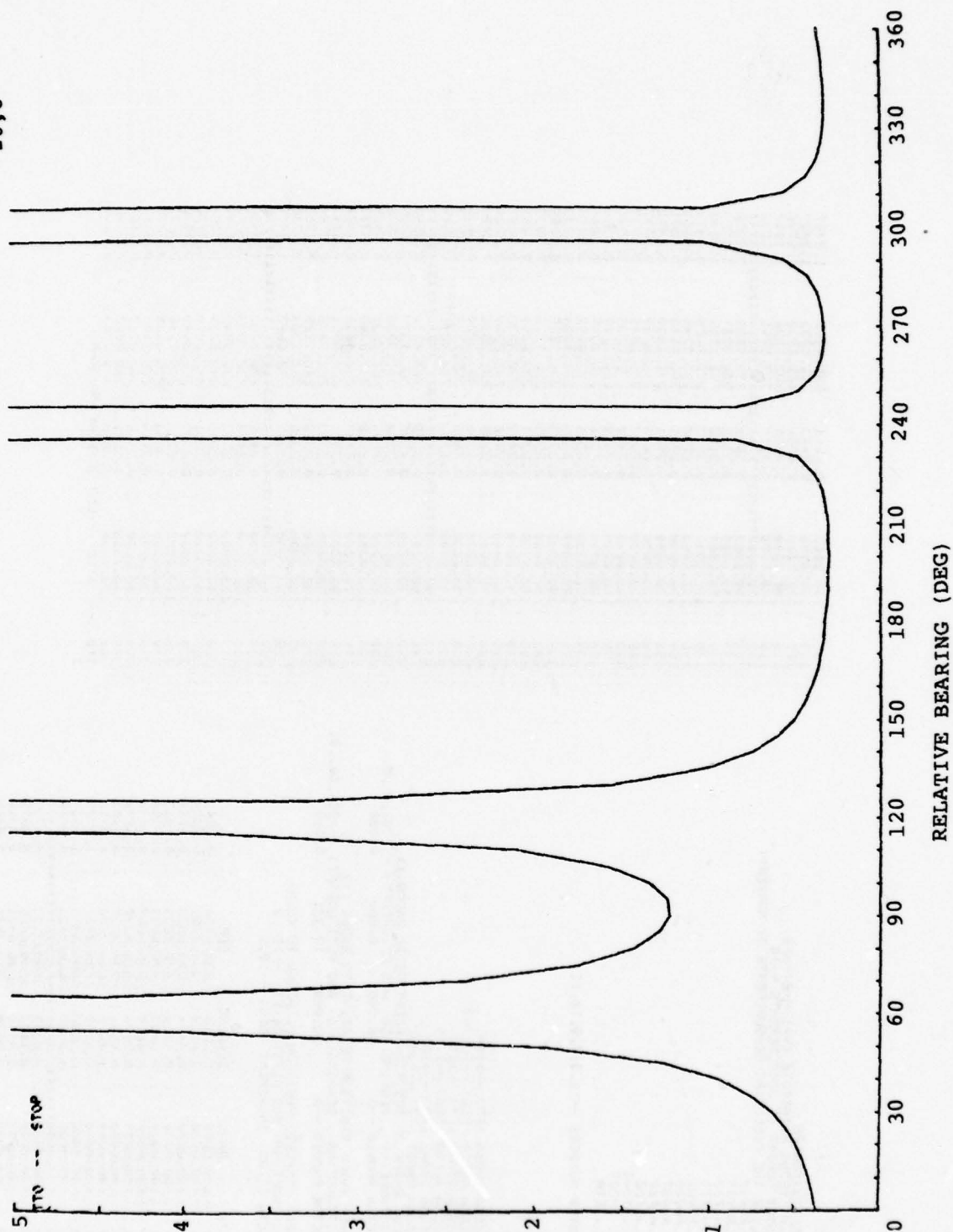








DUAL #32  
Transfer Alignment  
ATCRBS  
20,8



ATCRBS AZIMUTH (DEG)

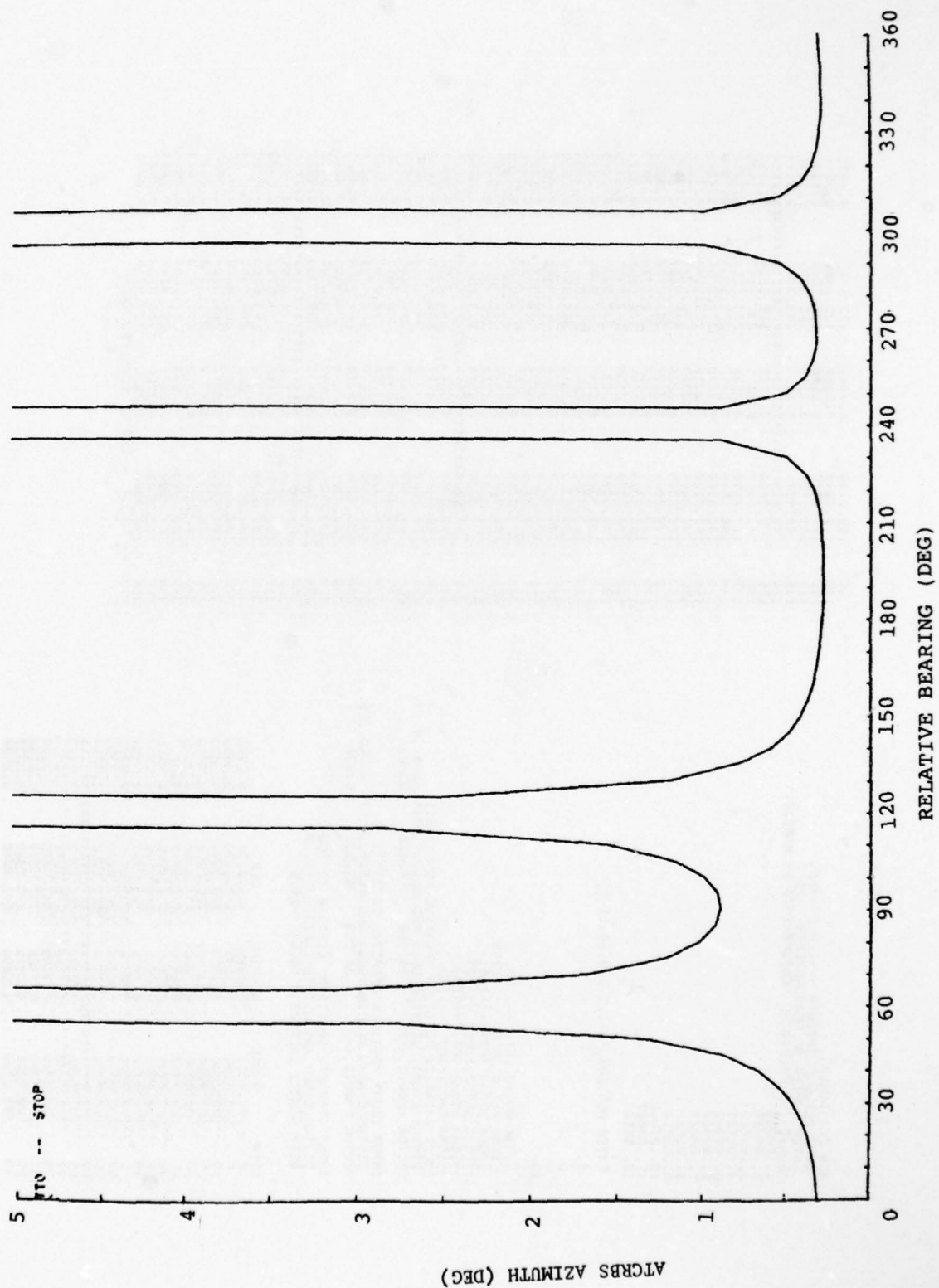
E-145







DUAL #32  
Transfer Alignment  
50,10

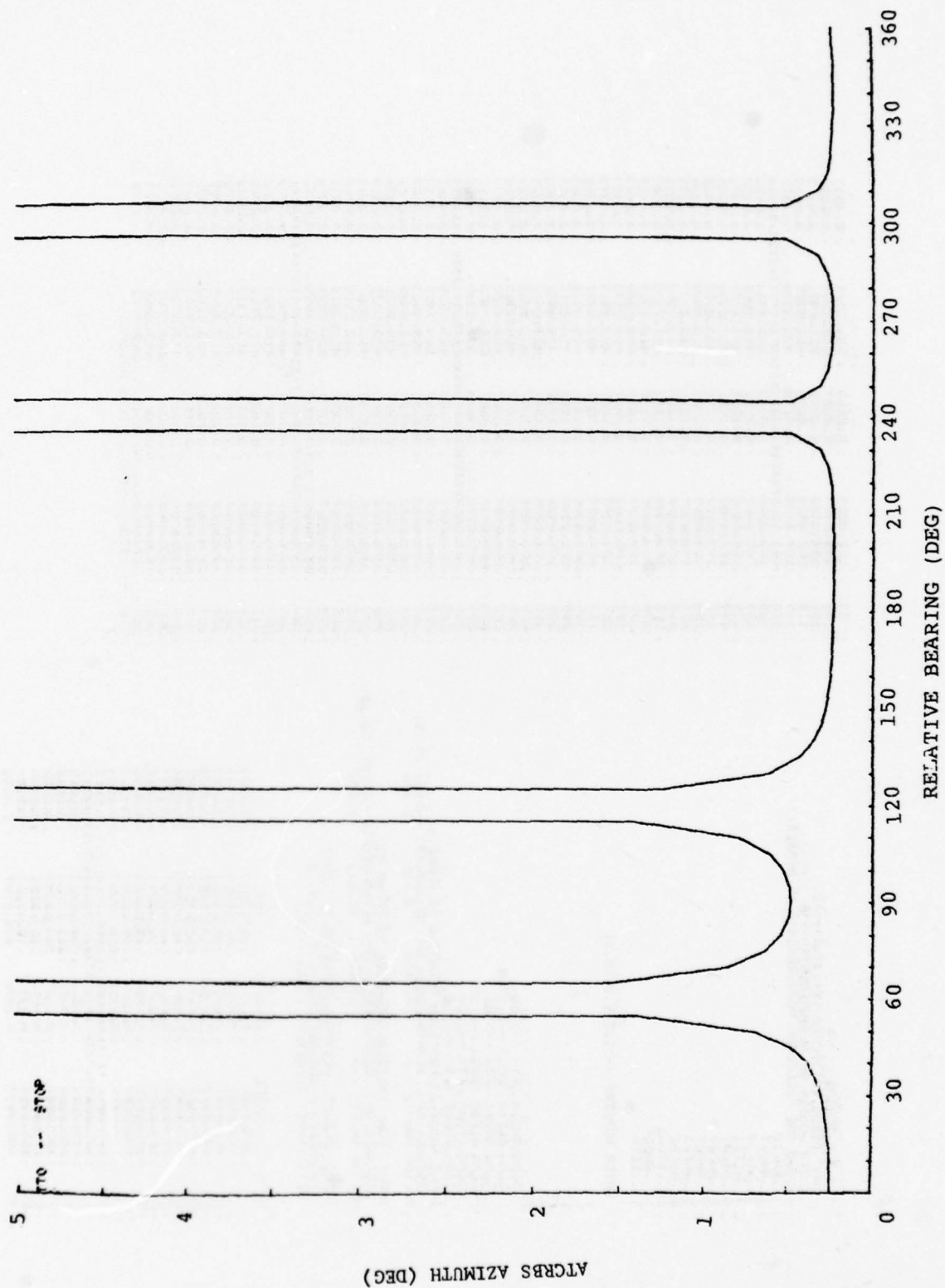








Transfer Alignment  
DUAL #32  
ATCRBS  
100,20 equivalent





[illegible]



MONTE CARLO  
SIMULATION

PROGRAM LISTING  
FOR  
THE  
MONTE CARLO SIMULATION

ATTACHMENT III



ET UIC:110,1103  
PIP PAI: LI

DIRECTORY DK11E110,1103  
22-MAR-78 08:50

✓ SREAD.FTN;32	12.	17-MAR-78 09:01
✓ ALGOR.FTN;203	24.	17-MAR-78 09:01
ALGOR.OBJ;1	58.	17-MAR-78 09:01
DRIVE.OBJ;1	23.	17-MAR-78 09:01
VECTOR.OBJ;1	4.	17-MAR-78 09:01
CARLOS.OBJ;1	10.	17-MAR-78 09:01
MONT.OBJ;1	21.	17-MAR-78 09:01
SREAD.OBJ;1	1.	17-MAR-78 09:01
CAS.CMD;13	60.	C 17-MAR-78 09:01
CAST.TSK;12	6.	17-MAR-78 09:01
✓ MONT.FTN;5	2.	17-MAR-78 09:01
✓ CARLOS.FTN;5	23.	17-MAR-78 09:01
DRIVE.FTN;107	60.	C 17-MAR-78 09:01
CAST.TSK;1	10.	17-MAR-78 09:01
VECTOR.FTN;47		

TOTAL OF 342. BLOCKS IN 15. FILES



PIP TI:DK1:CAS.CMD  
DK1:CAST-DK1:DRIVE,DK1:UECTOR,DK1:MONT,DK1:ALGOR,DK1:CARLOS,DK1:READ  
LIBR-FORRES:RO  
//



```

*IP TI:DK1:SRAD.FTN
C-----READ IN ONE SIGMA ERRORS-----
C-----READ IN CASE1 ERRORS-----
C
C      +
C      SUBROUTINE SREAD1(ALF10S,ALF1TS,ALF20S,ALF2TS,
C      RHO10S,RHO20S,H0S,HTS,BIAS)
C      DOUBLE PRECISION ALF10S,ALF1TS,ALF20S,ALF2TS
C      DOUBLE PRECISION RHO10S,RHO20S,H0S,HTS
C      DOUBLE PRECISION CONVR,CONVR,CONVR,BIAS
C      DATA CONVR/57.2957795131D0/
C      DATA CONVR/6076.115D0/
C      CALL ALF (ALF10S,ALF20S)
C      CALL ALF (ALF1TS,ALF2TS)
C      CALL RHO (RHO10S,RHO20S)
C
C      WRITE(5,40)
C      READ(5,11)H0S,HTS
C      H0S=H0S/CONVR
C      HTS=HTS/CONVR
C
C      WRITE(5,50)
C      READ(5,12)BIAS
C      BIAS=BIAS/CONVR
C
C      RETURN
C      FORMAT(1H,' ALT 0, ALT <T> ERRORS (FT) --> ')
C      FORMAT(1H,' BIAS ON ALF20 (DEG) --> ')
C      FORMAT(2F10.4)
C      END
C-----READ IN CASE2 ERRORS-----
C
C      SUBROUTINE SREAD2(ALF10S,ALF1TS,RHO10S,DT0A1S)
C      DOUBLE PRECISION ALF10S,ALF1TS,RHO10S,DT0A1S
C      DOUBLE PRECISION CONVR,CONVR
C      DATA CONVR/57.2957795131D0/
C      DATA CONVR/6076.115D0/
C      WRITE(5,10)
C      READ(5,1)ALF10S
C      ALF10S=ALF10S/CONVR
C
C      WRITE(5,20)
C      READ(5,1)ALF1TS
C      ALF1TS=ALF1TS/CONVR
C
C      WRITE(5,30)
C      READ(5,1)RHO10S
C      RHO10S=RHO10S/CONVR
C
C      WRITE(5,40)
C      READ(5,1)DT0A1S
C
C      RETURN
C      FORMAT(F10.4)
C      FORMAT(1H,' ALF10 ERROR (DEG) --> ')
C      FORMAT(1H,' ALF1T ERROR (DEG) --> ')
C      FORMAT(1H,' RHO10 RANGE ERROR (FT) --> ')
C      FORMAT(1H,' DT0A1 TOA ERROR (FT) --> ')
C      END
C-----READ IN CASE3 AND CASE812 ERRORS-----
C
C      SUBROUTINE SREAD3(ALF10S,ALF1TS,RHO10S,DT0A1S,RHO0TS)
C      DOUBLE PRECISION ALF10S,ALF1TS,RHO10S,DT0A1S,RHO0TS,CO
C      DATA CONVR/6076.115D0/
C      DATA CONVR/6076.115D0/
C      CALL SREAD2(ALF10S,ALF1TS,RHO10S,DT0A1S)
C      CALL RHO1(RHO0TS)
C      RETURN
C      END
C-----READ IN CASE84 ERRORS-----
C
C      SUBROUTINE SREAD4(ALF10S,ALF1TS,DT0A1S,RHO0TS)
C      DOUBLE PRECISION ALF10S,ALF1TS,DT0A1S,RHO0TS,CONVR,C
C      DATA CONVR/6076.115D0/
C      DATA CONVR/57.2957795131D0/
C      WRITE(5,10)
C      READ(5,1)ALF10S
C      ALF10S=ALF10S/CONVR
C
C      WRITE(5,20)
C      READ(5,1)ALF1TS
C      ALF1TS=ALF1TS/CONVR
C
C      WRITE(5,30)
C      READ(5,1)DT0A1S
C      DT0A1S=DT0A1S/CONVR
C
C      CALL RHO1(RHO0TS)
C
C      RETURN
C      FORMAT(F10.4)
C      FORMAT(1H,' ALF10 ERROR (DEG) --> ')
C      FORMAT(1H,' ALF1T ERROR (DEG) --> ')
C      FORMAT(1H,' DT0A1 ERROR (FT) --> ')
C      END
C-----READ IN CASE85 ERRORS-----
C
C      SUBROUTINE SREAD5(ALF10S,ALF20S,ALF1TS,ALF2TS,DT0A1S,
C      DT0A2S)
C      DOUBLE PRECISION ALF10S,ALF20S,ALF1TS,ALF2TS,DT0A1S,D

```







```

10  FORMAT(1H8,' RHO10,RHO20 RANGE ERRORS (FT) -->')
   END
C.....
C
SUBROUTINE TOA(DTOA1S,DTOA2S)
DOUBLE PRECISION DTOA1S,DTOA2S,CONUNH
DATA CONUNH/6076.115D0/
C
WRITE(5,10)
READ(5,1)DTOA1S,DTOA2S
DTOA1S=DTOA1S/CONUNH
DTOA2S=DTOA2S/CONUNH
C
RETURN
1  FORMAT(2F10.4)
10  FORMAT(1H8,' TOA1,TOA2 ERRORS (FT) -->')
   END
C.....
C
SUBROUTINE RHO1(RHO0TS)
DOUBLE PRECISION RHO0TS,CONUNH
DATA CONUNH/6076.115D0/
C
WRITE(5,10)
READ(5,1)RHO0TS
RHO0TS=RHO0TS/CONUNH
C
RETURN
1  FORMAT(F10.4)
10  FORMAT(1H8,' TARGET RANGE ERROR (FT) -->')
   END
>

```



```

>PIP TT=DK1ALQ08.FTN
1 SUBROUTINE ALGOR1(ALF10,ALFD1,ALF20,ALF22,
C RHO10,RHO20,H0,MT,RHOV0T)
C
C DOUBLE PRECISION ALF10,ALFD1,ALF20,ALF22
C DOUBLE PRECISION RHO10,RHO20,H0,MT
C DOUBLE PRECISION D10,D20,D12,D22,D1213
C DOUBLE PRECISION EV10(3),EV20(3),EV1T(3),EV2T(3),EV12(3)
C DOUBLE PRECISION EV12(3),TEMP(3),TEMP
C DOUBLE PRECISION A,GAMMA,BETA1,BETA2,ALF1T,ALF2T
C DOUBLE PRECISION RHOV12(3),RHOV2T(3),RHOV1T(3)
C DOUBLE PRECISION RHOV1(3),RHOV2(3),RHOV0T
C DOUBLE PRECISION RHOV10(3),RHOV20(3),CONVD
C DATA CONVD/57.295779513104/ ! DEG --> RADIAN CONV FACTOR
C
C D10=DSORT(RHO10,RHO20,H0,H0)
C D20=DSORT(RHO20,RHO20,H0,H0)
C
C EV10(1)=COS(ALF10)
C EV10(2)=SIN(ALF10)
C EV10(3)=0.000
C
C EV20(1)=COS(ALF20)
C EV20(2)=SIN(ALF20)
C EV20(3)=0.000
C
C RHOV10(1)=D10*DCOS(ALF10)
C RHOV10(2)=D10*DSIN(ALF10)
C RHOV10(3)=H0
C
C RHOV20(1)=D20*DCOS(ALF20)
C RHOV20(2)=D20*DSIN(ALF20)
C RHOV20(3)=H0
C
C CALL SUB(RHOV10,RHOV20,RHOV12)
C
C ALF1T=ALF10+ALFD1
C ALF2T=ALF20+ALFD2
C
C EV1T(1)=COS(ALF1T)
C EV1T(2)=SIN(ALF1T)
C EV1T(3)=0.000
C
C EV2T(1)=COS(ALF2T)
C EV2T(2)=SIN(ALF2T)
C EV2T(3)=0.000
C
C CALL LATRL(RHOV12,DV12)
C CALL MAG(DV12,DV12)
C
C CALL CROSS(EV2T,EV1T,TEMPU)
C CALL DOT(EV2T,EV1T,TEMP)
C GAMMA=DATAN2(TEMPU(3),TEMP)
C
C CALL CROSS(EV1T,EV12,TEMPU)
C CALL DOT(EV1T,EV12,TEMP)
C BETA1=DATAN2(TEMPU(3),TEMP)
C
C A=-1.000
C CALL MULT(EV12,A,EV012)
C
C CALL CROSS(EV012,EV2T,TEMPU)
C CALL DOT(EV012,EV2T,TEMP)
C BETA2=DATAN2(TEMPU(3),TEMP)
C
C D1T=DABS(D12*DSIN(BETA1)/DSIN(GAMMA))
C D2T=DABS(D12*DSIN(BETA1)/DSIN(GAMMA))
C
C RHOV1T(1)=D1T*DCOS(ALF1T)
C RHOV1T(2)=D1T*DSIN(ALF1T)
C RHOV1T(3)=H0
C
C RHOV2T(1)=D2T*DCOS(ALF2T)
C RHOV2T(2)=D2T*DSIN(ALF2T)
C RHOV2T(3)=H0
C
C CALL SUB(RHOV1T,RHOV10,RHOV1)
C CALL SUB(RHOV2T,RHOV20,RHOV2)
C
C CALL ADD(RHOV1,RHOV2,RHOV0T)
C A=0.500
C CALL MULT(RHOV0T,A,RHOV0T)
C
C RETURN
C END
C-----
C SINGLE SITE PASSIVE SOLUTION
C NUMBER ONE
C-----
C SUBROUTINE SINPA5(ALF10,ALFD1,RHO10,DT0A1,RHOV0T)
C
C DOUBLE PRECISION ALF10,ALFD1,RHO10,DT0A1
C DOUBLE PRECISION RHOV10(3),RHOV0T,TEMP
C DOUBLE PRECISION RHOV10(3),RHOV1T(3),RHOV0T(3)
C
C RHO1T=DT0A1*DT0A1+2.000*DT0A1*RHO10
C TEMP=2.000*(DT0A1+RHO10*(1.000-DCOS(ALFD1)))
C RHO1T=RHO1T/TEMP
C
C RHO0T=RHO10*(2.000*DT0A1+RHO10)*(1.000-DCOS(ALFD1))
C RHO0T=RHO0T/TEMP
C
C RHOV10(1)=RHO10*DCOS(ALF10)
C RHOV10(2)=RHO10*DSIN(ALF10)
C RHOV10(3)=0.000
C
C RHOV1T(1)=RHO1T*DCOS(ALF10+ALFD1)
C RHOV1T(2)=RHO1T*DSIN(ALF10+ALFD1)
C RHOV1T(3)=0.000
C
C CALL SUB(RHOV1T,RHOV10,RHOV0T)
C
C RETURN
C END
C-----
C SINGLE SITE PASSIVE SOLUTION
C NUMBER TWO
C-----
C SUBROUTINE SINPA2(ALF10,ALFD1,RHO10,DT0A1,RHOV0T)
C
C DOUBLE PRECISION ALF10,ALFD1,RHO10,DT0A1,BETA
C DOUBLE PRECISION RHOV10(3),RHOV0T,TEMP,THETA
C DOUBLE PRECISION RHOV0T(3)
C
C TEMP=2.000*(DT0A1+RHO10*(1.000-DCOS(ALFD1)))

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C      B-DTOA1*DCOS(AL1)*DSIN(TEMP)
C      B-B-DTOA2*DCOS(AL2)*DSIN(AL1)
C      C-(D10A1-D10A2)*8(DCOS(AL1)*DCOS(AL2))
C      POSA=(4.0D0*B-B-4.0D0*(C-A))*X(C+A)
C      IF(POSA.LT.0.0D0)POSA=0.0D0
C      POSA=DSORT(POSA)
C      POS=(-2.0D0*B+POSA)/(2.0D0*(C-A))
C      THETA(1)=2.0D0*DATAN(POS)
C      THETA(2)=THETA(1)+PI
C      NEG=(-2.0D0*B-POSA)/(2.0D0*(C-A))
C      THETA(3)=2.0D0*DATAN(NEG)
C      THETA(4)=THETA(3)+PI
C      WRITE(5,292)THETA(1),THETA(2),THETA(3),THETA(4)
C      FORMAT(' THETA...4 -->',4F10.4)
C      DO 10 I=1,4
C      IF(THETA(I).GT.PI) THETA(I)=THETA(I)-2.0D0*PI
C      BET(1)=THETA(1)-ALF10
C      D(1)=DABS(BET(1)-BETA)
C      CONTINUE
C      X=DRINI(D(1),D(2),D(3),D(4))
C      DO 20 I=1,4
C      IFIX=EQ. D(I)GOTO 30
C      CONTINUE
C      WRITE(5,666)D(1),D(2),D(3),D(4)
C      WRITE(5,292)THETA(1),THETA(2),THETA(3),THETA(4)
C      FORMAT(' D1...4 -->',4F10.3)
C      WRITE(5,667)X,BETA,1
C      FORMAT(' X,BETA,1 -->',2F10.3,14)
C      FORMAT(' BET1...4 -->',4F10.3)
C      BETA=BET(1)
C      RHOBT=T1/(2.0D0*(D10A1+RHO10*(1.0D0+DCOS(BETA-ALF10))))
C      RHOBT(1)=RHOBT*DCOS(BETA)
C      RHOBT(2)=RHOBT*DSIN(BETA)
C      RHOBT(3)=0.0D0
C      RETURN
C      END
C      RBX1:: IS CALLED BY MONTE6
C      SUBROUTINE RBX1(ALF10,ALF20,ALF10,RHO10,RHO20,
C      D10A1,D10A2,RHOBT,BETAT)
C      DOUBLE PRECISION ALF10,ALF20,RHO10,RHO20
C      DOUBLE PRECISION D10A1,D10A2,RHOBT(3),T1,T2
C      DOUBLE PRECISION A,B,C,PI,POSA
C      DOUBLE PRECISION POS,THETA(4),NEG,RHOT(4),RHOBT
C      DOUBLE PRECISION TAU1,TAU2,D(4),BET(4),BETA,X,BETAT
C      DATA PI/3.1415926535897932384626433832795
C      WRITE(5,288)ALF10,ALF20,ALF10,ALF20,D10A1,D10A2
C      FORMAT(' INPUTS -->',6F9.4)
C      BETA=BETAT*PI/180.0D0

```



```

DOUBLE PRECISION RHO12(3),RHO10,DV12(3),EV12(3)
DOUBLE PRECISION SINGT,COSGT,SINI,COSI,SINB,COSB
DOUBLE PRECISION D,GT,B1,B2,EPSIL,TEMP,RHO1T
DOUBLE PRECISION RHO2T,RHO1T,K1,K2,SINB,COSB
C
RHO10(1)=RHO12DCOS(ALF10)
RHO10(2)=RHO12DSIN(ALF10)
RHO10(3)=0.0D0
C
RHO20(1)=RHO22DCOS(ALF20)
RHO20(2)=RHO22DSIN(ALF20)
RHO20(3)=0.0D0
C
EV1T(1)=DCOS(ALF10+ALFD1)
EV1T(2)=DSIN(ALF10+ALFD1)
EV1T(3)=0.0D0
C
EV2T(1)=DCOS(ALF20+ALFD2)
EV2T(2)=DSIN(ALF20+ALFD2)
EV2T(3)=0.0D0
C
CALL SUB(RHO10,RHO20,RHO12)
CALL MAG(RHO10,RHO12)
C
CALL LATERL(RHO12,DV12)
CALL UNIT(DV12,EV12)
C
CALL CROSS(EV2T,EV1T,TEMPU)
SINGT=TEMPU(3)
CALL DOT (EV2T,EV1T,COSGT)
C
CALL CROSS(EV1T,EV12,TEMPU)
SINB1=TEMPU(3)
CALL DOT (EV1T,EV12,COSB1)
C
D=-1.0D0
CALL MULT(EV12,D,EV13)
CALL CROSS(EV12,EV2T,TEMPU)
SINB2=TEMPU(3)
CALL DOT (EV12,EV2T,COSB2)
C
GT=DATAN2(SINGT,COSGT)
B1=DATAN(SINB1,COSB1)
B2=DATAN(SINB2,COSB2)
C
EPSIL=DSIN(GT)*DSIN(GT)
EPSIL=EPSIL/(DSIN(GT-B2)-DSIN(GT-B1))
TEMP=((D*OAI-D*OAI)+(RHO10-RHO20))/RHO12
TEMP=TEMP-(DSIN(B2)-DSIN(B1))/DSIN(GT)
EPSIL=EPSIL*TEMP
C
GT=GT+EPSIL
B1=B1+EPSIL
B2=B2+EPSIL
C
C-----RESOLVE FOR DELTA EPSILON-----
C
EPSIL=DSIN(GT)*DSIN(GT)
EPSIL=EPSIL/(DSIN(GT-B2)-DSIN(GT-B1))
TEMP=((D*OAI-D*OAI)+(RHO10-RHO20))/RHO12
TEMP=TEMP-(DSIN(B2)-DSIN(B1))/DSIN(GT)
EPSIL=EPSIL*TEMP
C
RHO1T=RHO12*DSIN(B2)/DSIN(GT)
RHO2T=RHO12*DSIN(B1)/DSIN(GT)
RHO1T=(D*OAI+RHO10-RHO1T+D*OAI+RHO20-RHO2T)/2.0D0
K1=D*OAI+D*OAI+2.0D0+RHO10+RHO10
K1=K1/(2.0D0+RHO10+RHO10)
K1=K1-(D*OAI+RHO10)/RHO10
K2=D*OAI+D*OAI+2.0D0+RHO20+RHO20
K2=K2/(2.0D0+RHO20+RHO20)
K2=K2-(D*OAI+RHO20)/RHO20
SINB=K1*DCOS(ALF20)-K2*DCOS(ALF10)
SINB=SINB/DSIN(ALF10-ALF20)
COSB=K2*DSIN(ALF10)-K1*DSIN(ALF20)
COSB=COSB/DSIN(ALF10-ALF20)
RHO1T(1)=RHO1T+COSB
RHO1T(2)=RHO1T+SINB
RHO1T(3)=0.0D0
C
RETURN
END
C-----
C DABS411 IS CALLED BY MONTEB
C-----
SUBROUTINE DABS4(RHO10,RHO1T,ALF10,ALF1T,RHO10T)
DOUBLE PRECISION RHO10,RHO1T,ALF10,ALF1T,RHO10T(3)
RHO1T(1)=RHO10*DCOS(ALF10)+RHO1T*DCOS(ALF1T)
RHO1T(2)=RHO10*DSIN(ALF10)+RHO1T*DSIN(ALF1T)
RHO1T(3)=0.0D0
C
RETURN
END

```







```

>PIP T1:IN:CARLOS.FTH
C-----
C      MONTE11: CALLS DIRANT
C-----
C      SUBROUTINE DIRANT(RHOOT,BETAX,RHOVOT)
C      DOUBLE PRECISION RHOOT,RHOVOT(3),BETAX
C      RHOVOT(1)=RHOOT*DCOS(BETAX)
C      RHOVOT(2)=RHOOT*DSIN(BETAX)
C      RHOVOT(3)=0.0D0
C      RETURN
C      END
C-----
C      MONTE12:FRONTEND: CALLS A3A12
C-----
C      SUBROUTINE A3A12(ALF10,ALF1T,RHO10,DT0A1,RHOOT,RHOVOT)
C      DOUBLE PRECISION ALF10,ALF1T,RHO10,DT0A1,RHOVOT(3)
C      DOUBLE PRECISION RHO1T,RHOOT,BETA
C      RHO1T=DT0A1*RHO10-RHOOT
C      BETA=RHO1T*DSIN(ALF1T-ALF10)
C      BETA=ALF10+DATA2(BETA,(RHO1T*DCOS(ALF1T-ALF10)-RHO10))
C      RHOVOT(1)=RHOOT*DCOS(BETA)
C      RHOVOT(2)=RHOOT*DSIN(BETA)
C      RHOVOT(3)=0.0D0
C      RETURN
C      END
>

```















PIP TI-DK:VECTOR.FTN

THESE ROUTINES HELP IN OPERATING  
ON 3-ELEMENT VECTORS.

1. DOT
2. CROSS
3. ADD
4. SUB
5. MULT
6. MAG
7. LATERL
8. UNIT

#### MISCELL ROUTINES

1. GAUSS
2. DIRTY
3. STAT
4. ANGLE
5. ARCCOS
6. ANCHOD

SUBROUTINE DOT(UA,UB,SC)  
DOUBLE PRECISION UA(3),UB(3),SC

SC=UA(1)\*UB(1)+UA(2)\*UB(2)+UA(3)\*UB(3)

RETURN  
END

SUBROUTINE CROSS(UA,UB,UC)  
DOUBLE PRECISION UA(3),UB(3),UC(3)

UC(1)=UA(2)\*UB(3)-UA(3)\*UB(2)  
UC(2)=UA(3)\*UB(1)-UA(1)\*UB(3)  
UC(3)=UA(1)\*UB(2)-UA(2)\*UB(1)

RETURN  
END

SUBROUTINE ADD(UA,UB,UC)  
DOUBLE PRECISION UA(3),UB(3),UC(3)

UC(1)=UA(1)+UB(1)  
UC(2)=UA(2)+UB(2)  
UC(3)=UA(3)+UB(3)

RETURN  
END

SUBROUTINE SUB(UA,UB,UC)  
DOUBLE PRECISION UA(3),UB(3),UC(3)

UC(1)=UA(1)-UB(1)  
UC(2)=UA(2)-UB(2)  
UC(3)=UA(3)-UB(3)

RETURN  
END

SUBROUTINE MULT(UA,B,UC)  
DOUBLE PRECISION UA(3),UC(3),B

UC(1)=B\*UA(1)  
UC(2)=B\*UA(2)  
UC(3)=B\*UA(3)

RETURN  
END

SUBROUTINE MAG(UA,A)  
DOUBLE PRECISION UA(3),A

A=DSORT(UA(1)\*UA(1)+UA(2)\*UA(2)+UA(3)\*UA(3))

RETURN  
END

SUBROUTINE LATERL(UA,UB)  
DOUBLE PRECISION UA(3),UB(3)

UB(1)=UA(1)  
UB(2)=UA(2)  
UB(3)=0.0D0

RETURN  
END

SUBROUTINE UNIT(UA,UE)  
DOUBLE PRECISION UA(3),UE(3),A

CALL MAG(UA,A)  
IF(A.NE.0.0D0)A=1.0D0/A  
CALL MULT(UA,A,UE)

RETURN  
END

SUBROUTINE GAUSS(IX,IV,DIRT)  
DOUBLE PRECISION DIRT

DIRT=-6.0D0

DO 999 I=1,12  
TEMP=RA(I,IV)  
DIRT=DIRT+DBLE(TEMP)

999

CONTINUE



```

C      RETURN
C      END
C-----
C      SUBROUTINE DIRTY(A,B,C,IX,IV)
C      DOUBLE PRECISION A,B,C,DIRT
C      CALL GAUSS(IX,IV,DIRT)
C      C=A*B*DIRT
C      RETURN
C      END
C-----
C      SUBROUTINE STAT(VECTOR,AVER,SDEV)
C      DOUBLE PRECISION VECTOR(50),SUM,DIFF,AVER,SDEV
C      SUM=0.0D0
C      DO 10 I=1,50
C      SUM=SUM+VECTOR(I)
C      CONTINUE
C      AVER=SUM/50.0D0
C      SDEV=DSORT(SUM/DBLE(FLOAT(NUM-1)))
C      RETURN
C      END
C-----
C      SUBROUTINE STAT(VECTOR,AVER,SDEV,NUM)
C      DOUBLE PRECISION VECTOR(50),SUM,DIFF,AVER,SDEV
C      SUM=0.0D0
C      DO 10 I=1,NUM
C      SUM=SUM+VECTOR(I)
C      CONTINUE
C      AVER=SUM/DBLE(FLOAT(NUM))
C      SDEV=DSORT(SUM/DBLE(FLOAT(NUM-1)))
C      RETURN
C      END
C-----
C      SUBROUTINE ARCCOS(X,ANSWER)
C      DOUBLE PRECISION X,ANSWER,PI
C      DATA PI/3.141592654356D0/
C      !THE CONSTANT PI
C      IF(X .GT. 1.0D0)GOTO 40
C      IF(X .LT. -1.0D0)GOTO 50
C      IF(X .EQ. 0.0D0)GOTO 5
C      IF(X .LT. 0.1D0) .AND. (X .GT. -0.1D0)GOTO 30
C      IF(X .GT. 0.0D0)GOTO 20
C      IF(X .LT. 0.0D0)GOTO 10
C-----X EQ ZERO-----
C      ANSWER=PI/2.0D0
C      RETURN
C-----X LT ZERO-----
C      ANSWER=DATAN(DSORT(1.0D0-XIX)/X)*PI
C      RETURN
C-----X GT ZERO-----
C      ANSWER=DATAN(DSORT(1.0D0-XIX)/X)
C      RETURN
C-----CLOSE TO ZERO-----
C      ANSWER=(PI/2.0D0)-DATAN(X/DSORT(1.0D0-XIX))
C      RETURN
C-----X GT ONE OR X LT ONE-----
C      X=1.0D0
C      GOTO 20
C      X=-1.0D0
C      GOTO 10
C      END
C-----
C      ANGLE MODULO SUBROUTINE-----
C      SUBROUTINE ANGMOD(ANGIN,ANGOUT)
C      DOUBLE PRECISION ANGIN,ANGOUT,PI
C      PI=3.141592654D0
C      N=INT(DABS(ANGIN)/(2.0D0*PI))

```



```

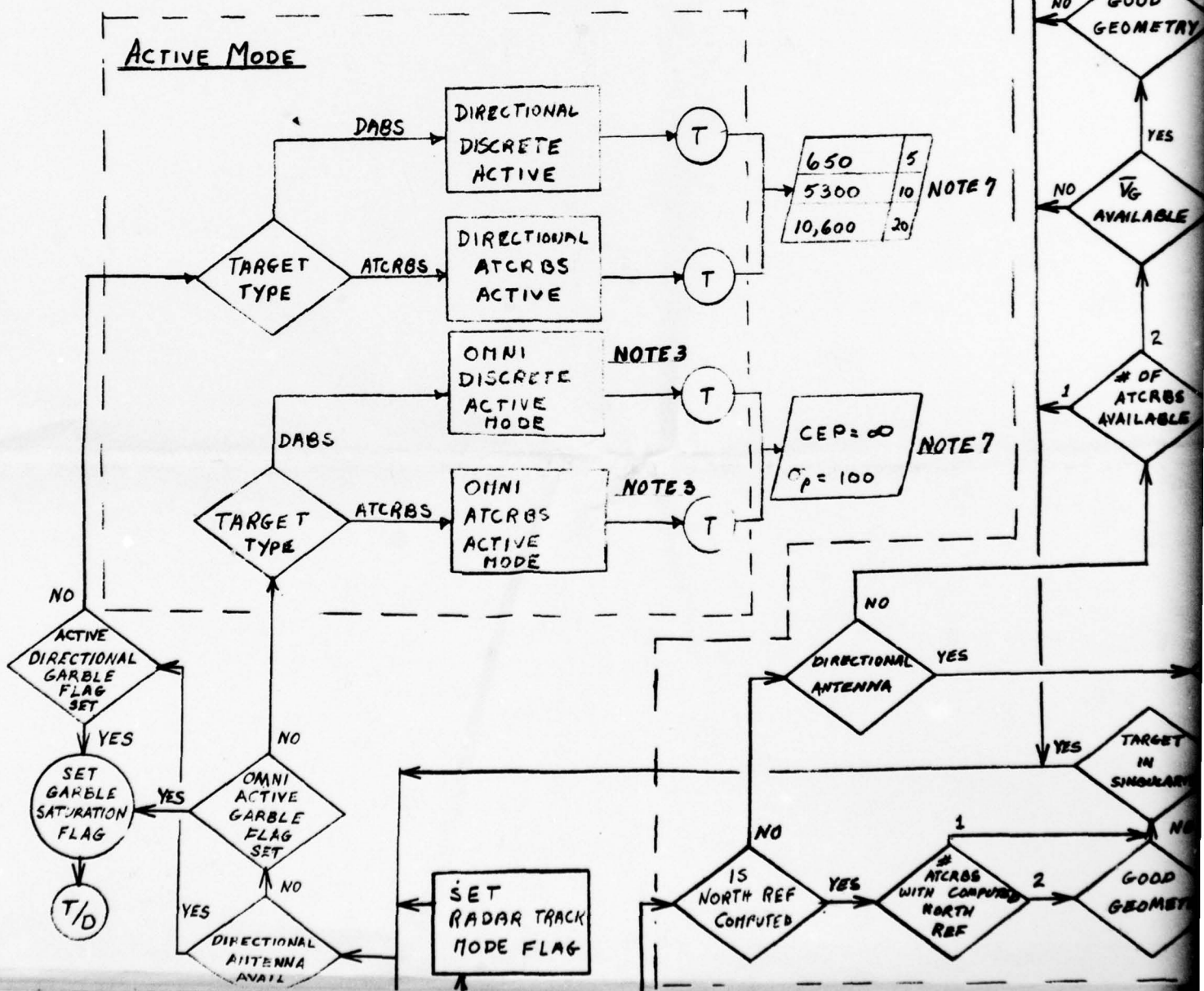
graph TD
    Start(( )) --> D1{MORE THAN ONE TARGET}
    D1 -- NO --> Loop1(( ))
    D1 -- YES --> D2{GOOD GEOMETRY}
    D2 -- NO --> Loop1
    D2 -- YES --> D3{VG AVAILABLE}
    D3 -- NO --> Loop1
    D3 -- YES --> D4{# OF ATCRBS AVAILABLE}
    D4 -- 1 --> Loop1
    D4 -- 2 --> D3
    Loop1 --> D1
    
```

Flowchart for Target Selection:

- Decision: MORE THAN ONE TARGET
  - NO: Loop back to start.
  - YES: Proceed to step 2.
- Decision: GOOD GEOMETRY
  - NO: Loop back to start.
  - YES: Proceed to step 3.
- Decision:  $\overline{V}_G$  AVAILABLE
  - NO: Loop back to start.
  - YES: Proceed to step 4.
- Decision: # OF ATCRBS AVAILABLE
  - 1: Loop back to start.
  - 2: Proceed to step 3.

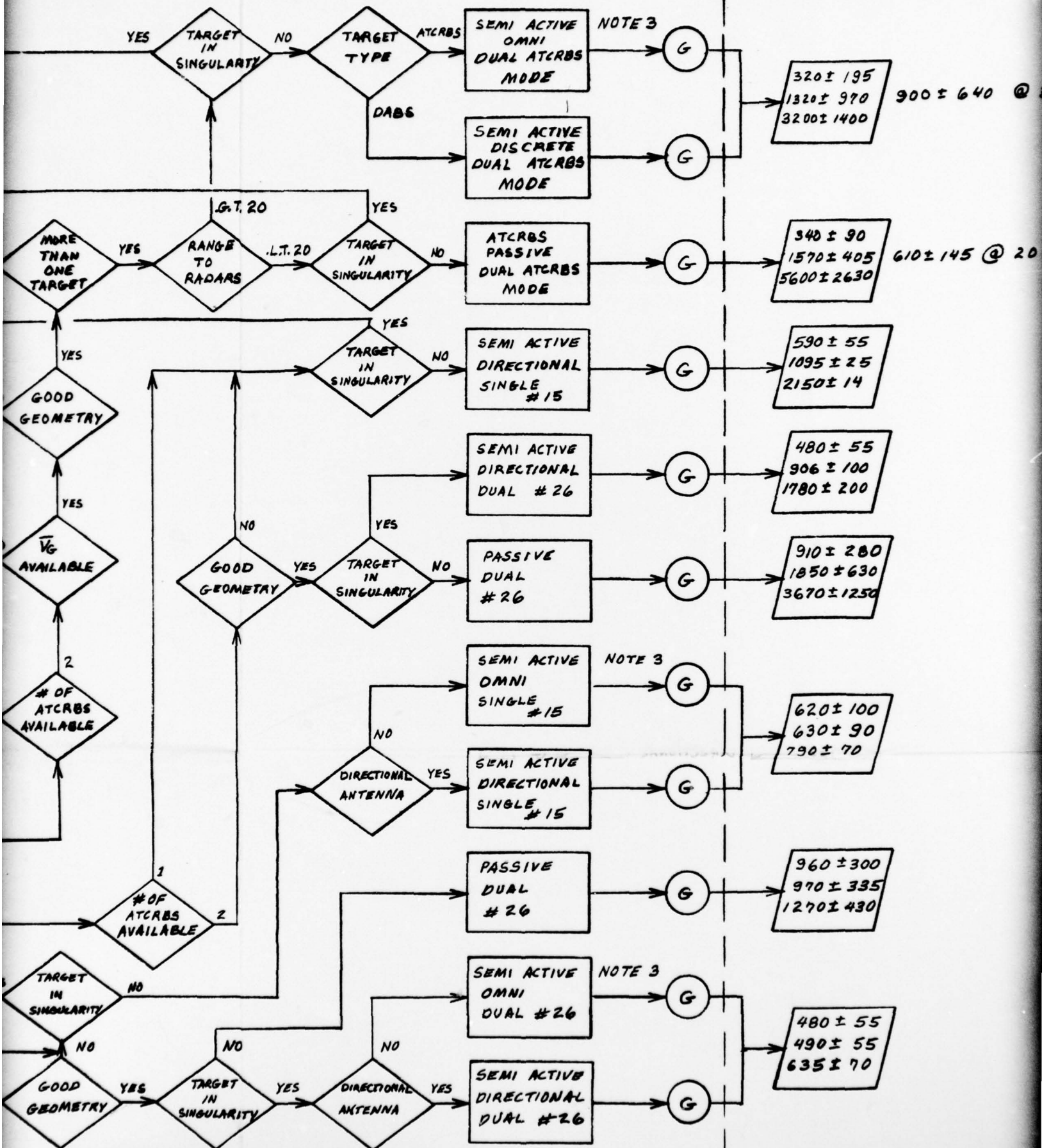
Flowchart for Target Singularity:

- Decision: TARGET IN SINGULARITY
  - YES: Proceed to step 2.
  - NO: Proceed to step 3.
- Decision: GOOD GEOMETRY
  - YES: Proceed to step 3.
  - NO: Loop back to step 1.





# RBS MODE

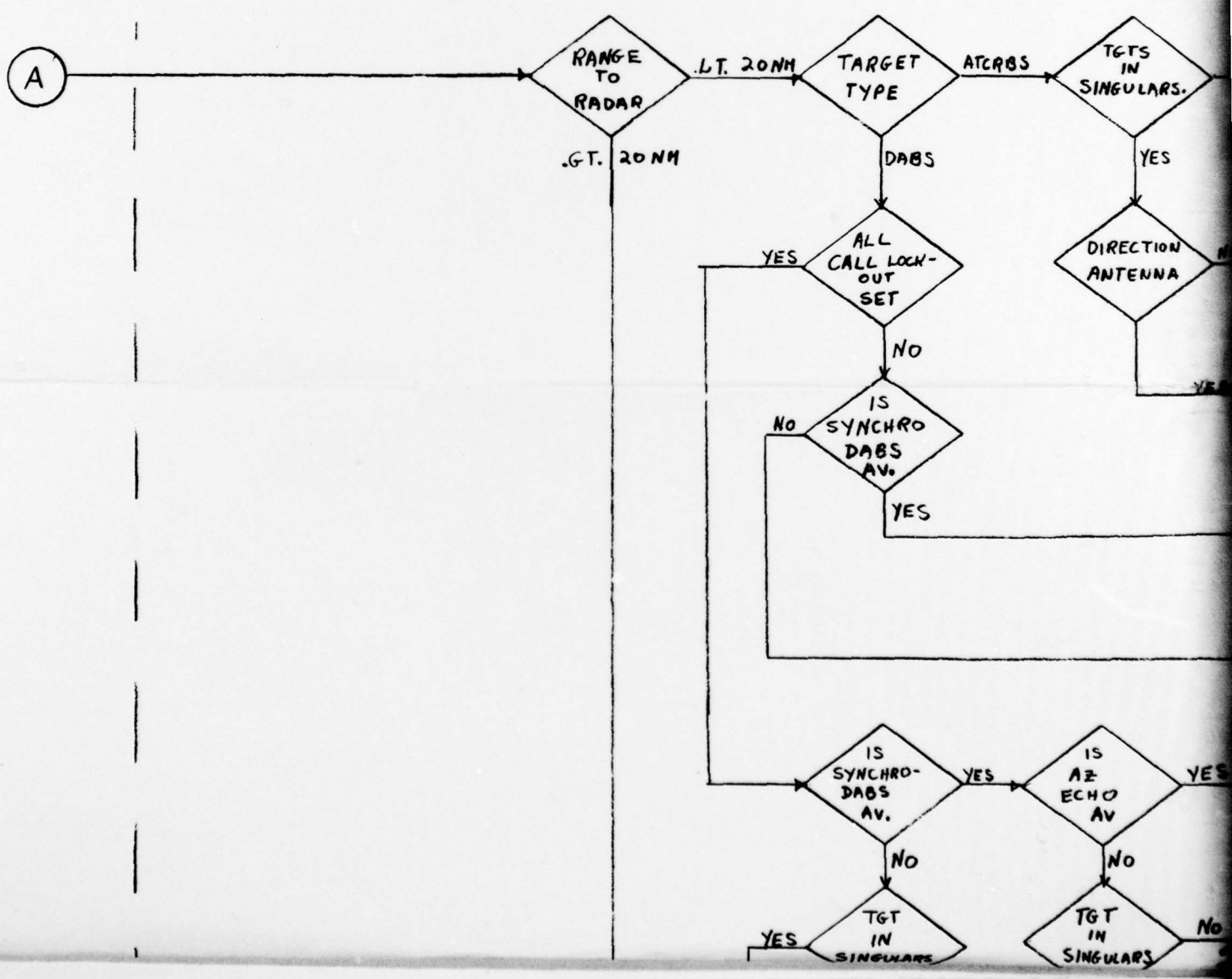




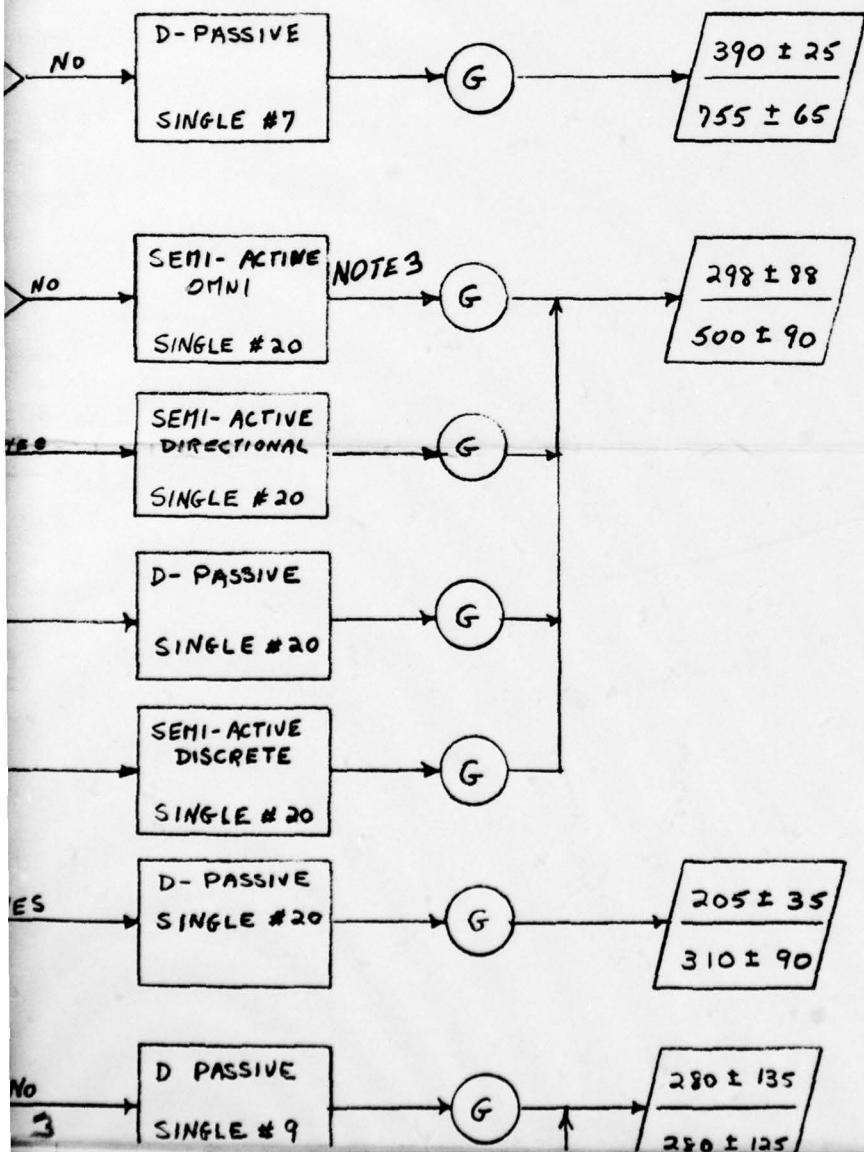
@ 35 mm

20 mm

SINGLE SITE DABS MODE







NOTE 1: PWI IS ON  
BEARING IS  
ACTIVE MOD

NOTE 2: SIMPLIFICAT  
OCCURS IF  
LOCKOUT

NOTE 3: ALL SEMI  
HIGH DENS  
DIRECTION

NOTE 4: THE DIREC

NOTE 5: AN RBX IS  
BY DABS

NOTE 6: R-PASSIVE

NOTE 7: THIS GEO



## NOTES

ONLY PROTECTION AGAINST PROXIMATE (1 NM) AIRCRAFT -  
IS REQUIRED FOR PROTECTION AND CANNOT BE PROVIDED IN THE  
MODE WITHOUT A DIRECTIONAL ANTENNA

IFICATION AND ACCURACY IMPROVEMENT IN THE SINGLE SITE DABS MODE  
IF SYNCHRO-DABS W. AZ. ECHO IS REQUIRED WHENEVER THE ALL CALL  
UT BIT IS SET IN DABS

SEMI-ACTIVE OMNI MODES AND ACTIVE OMNI MODES WILL SATURATE IN  
DENSITY AIRSPACE AND NO PROTECTION IS PROVIDED UNLESS A  
CTIONAL ANTENNA IS AVAILABLE

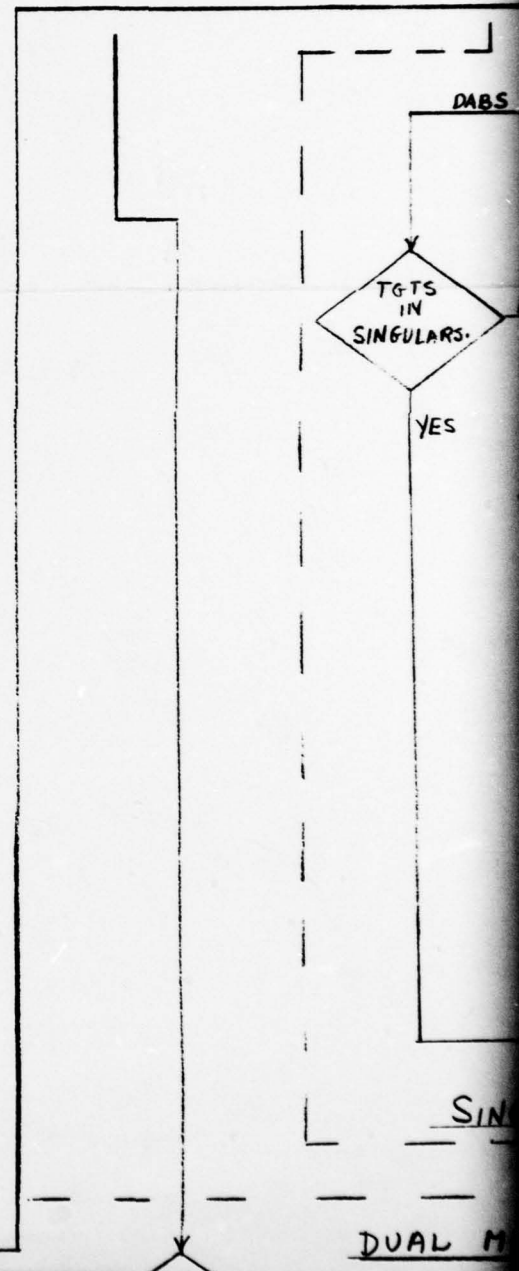
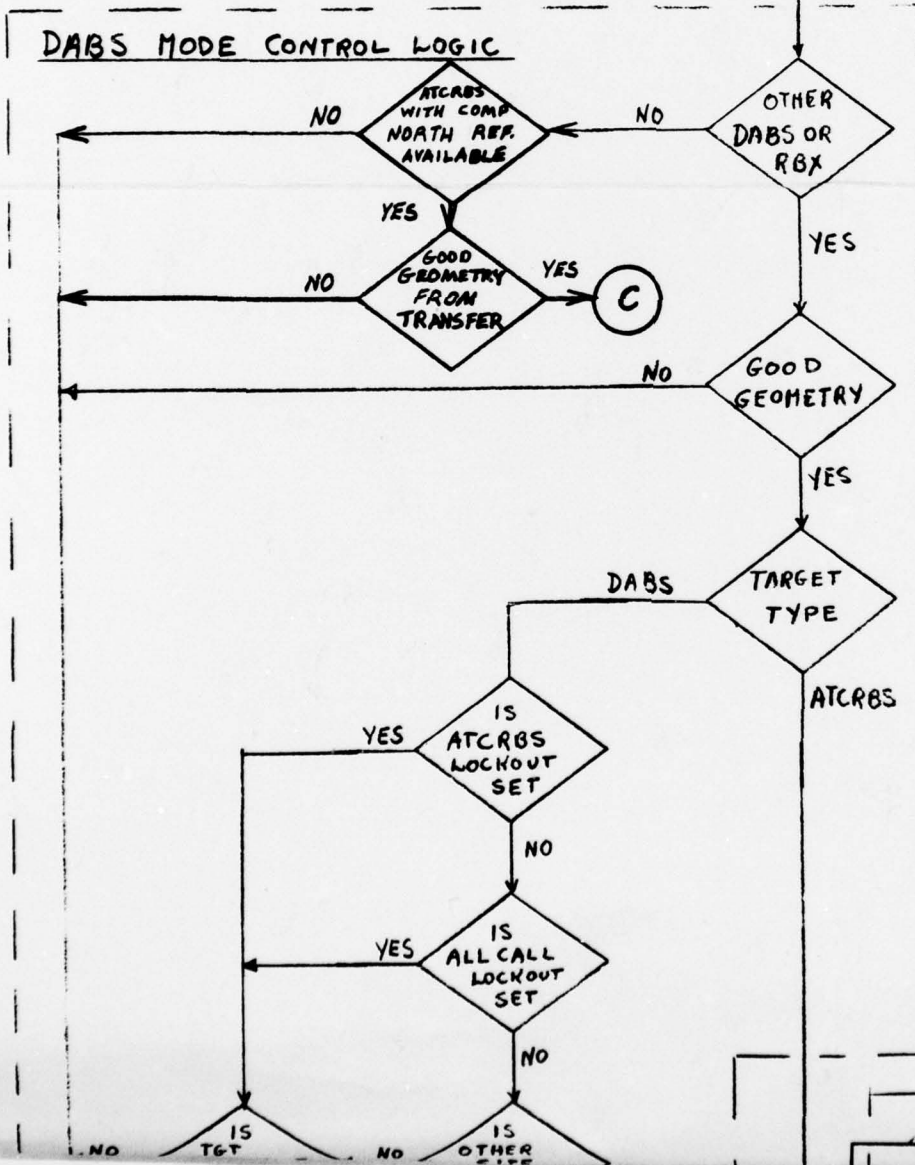
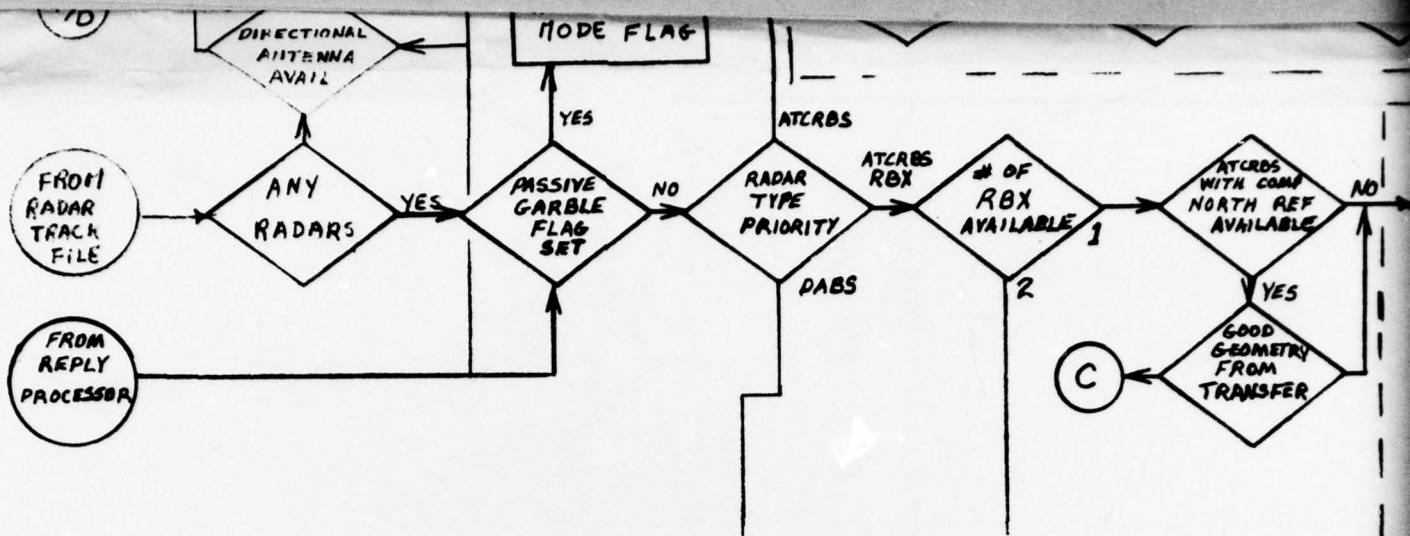
DIRECTIONAL ANTENNA CAN BE USED TO REDUCE PASSIVE GARBLE

X IS NOT REQUIRED AT DABS IF RANGE & AZIMUTH ARE BROADCASTED  
IBS

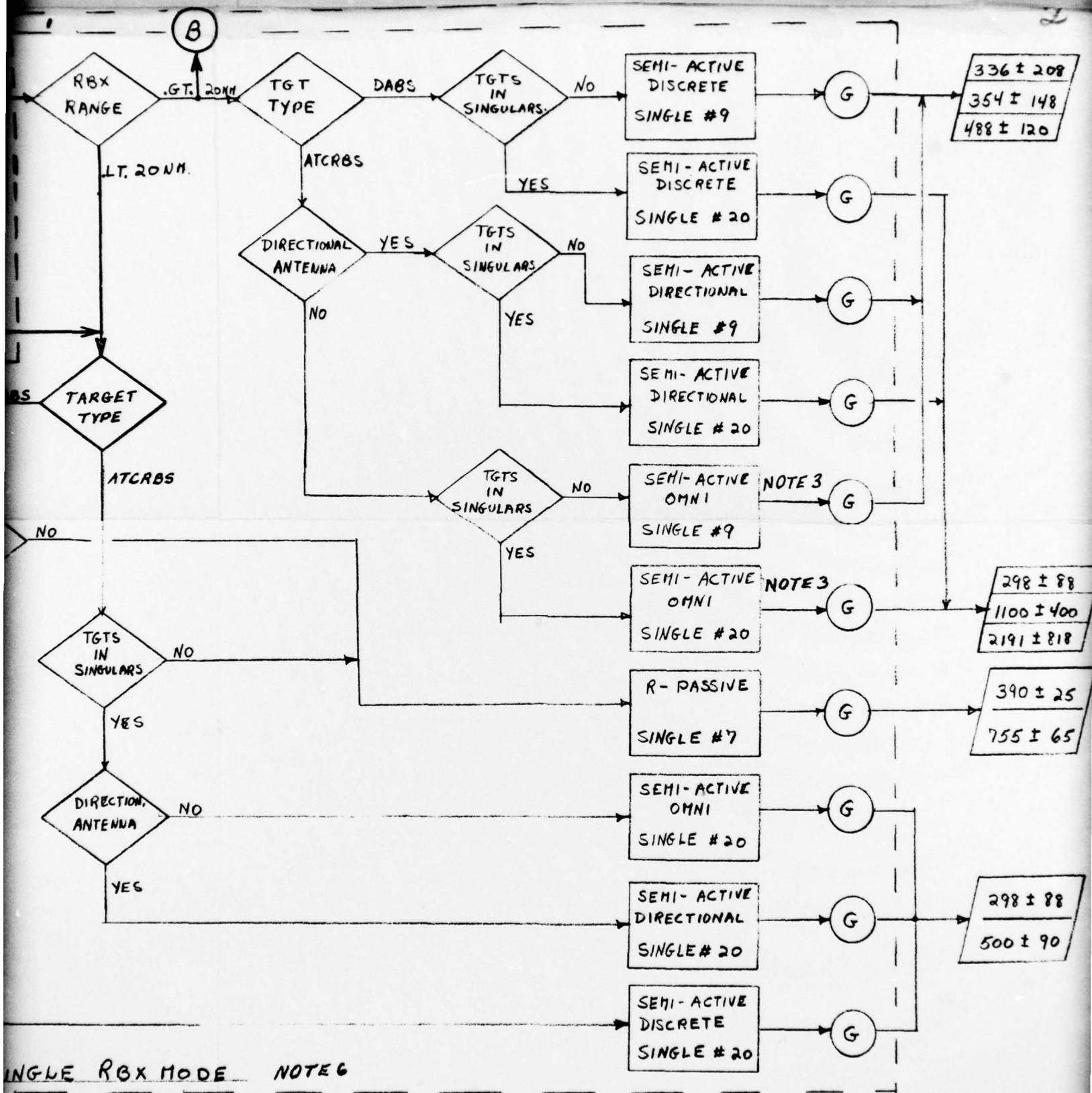
SIVE REQUIRES LOW PRF INTERROGATION OF THE RBOX

GEOMETRIC RECONSTRUCTION DOES NOT MEET REQUIRED ACCURACY



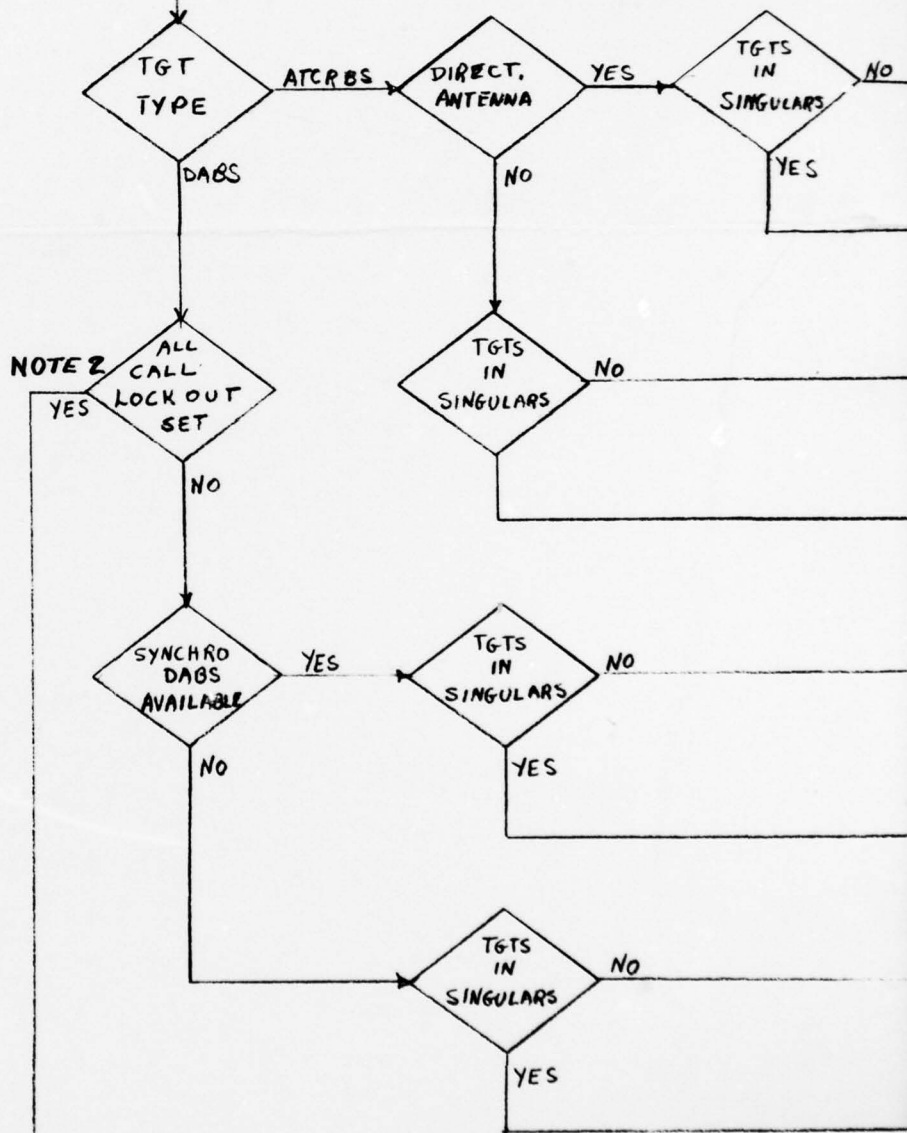






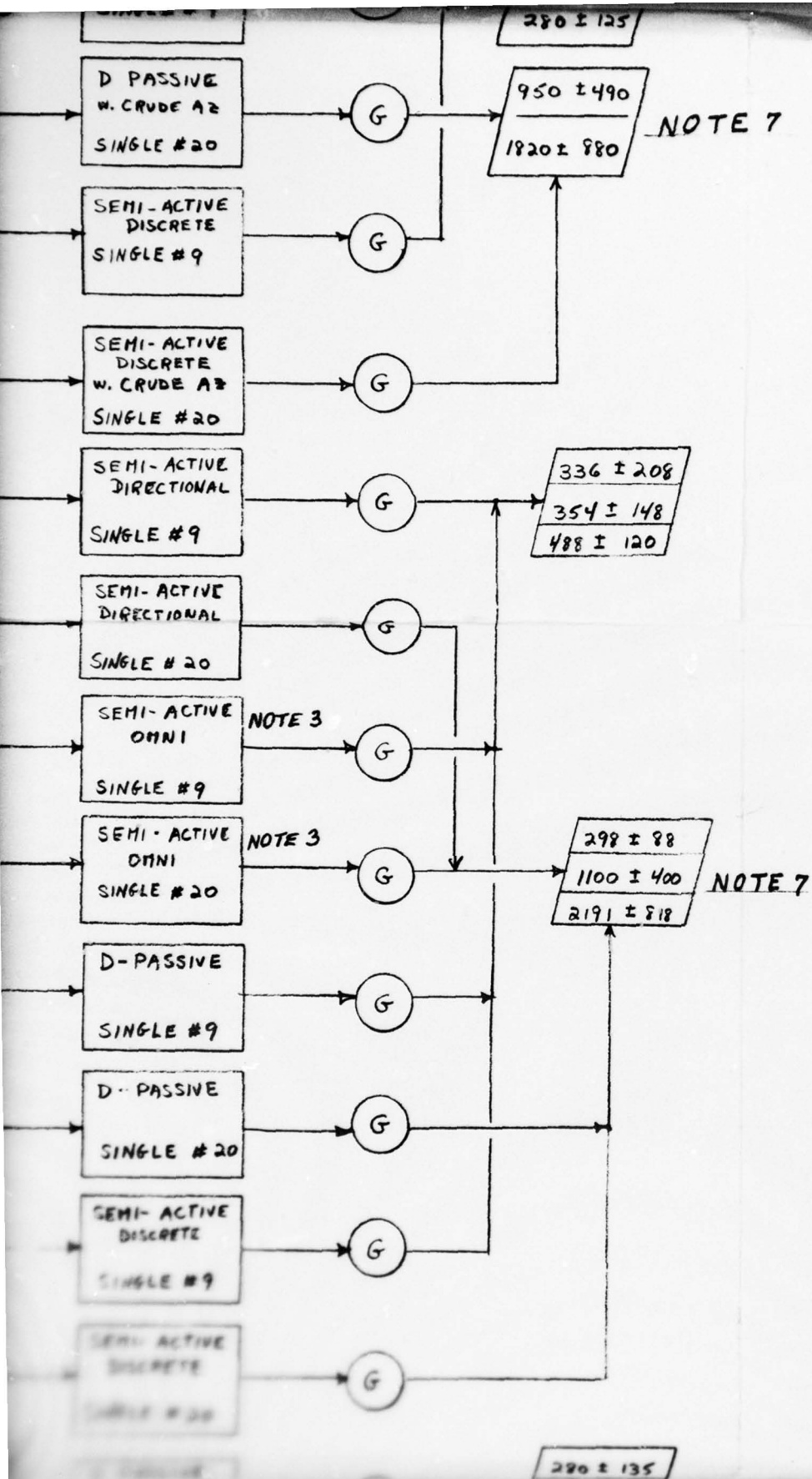


B



NOTE 7.







AND DATA TO TARGET TRACKER

FLAG TO RESOLUTION LOGIC AND DISPLAY

GS AND DATA TO GEOMETRIC RECONSTRUCTION

GS AND DATA TO RADAR SELECTION AND TRACKING

TRIC RECONSTRUCTION MODE

CY OF GEOMETRIC RECONSTRUCTION

, 50, 100 NM FROM RADARS OR

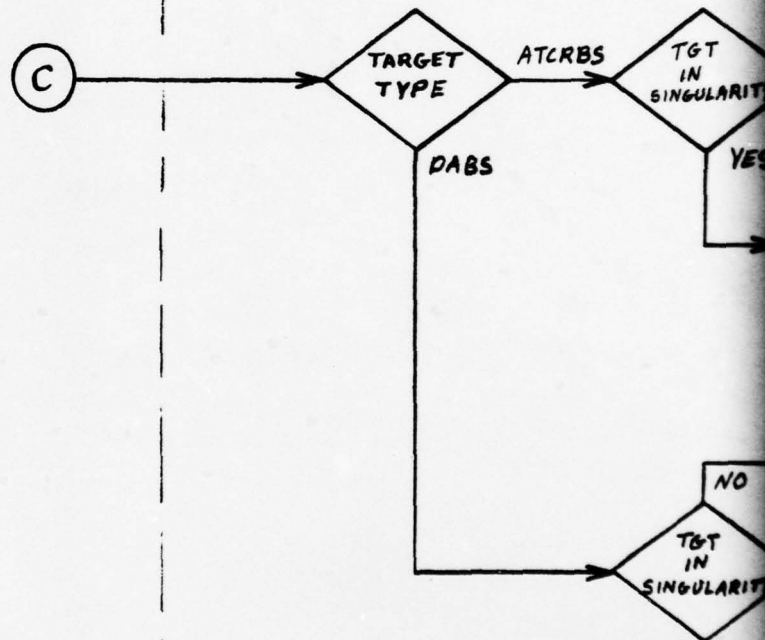
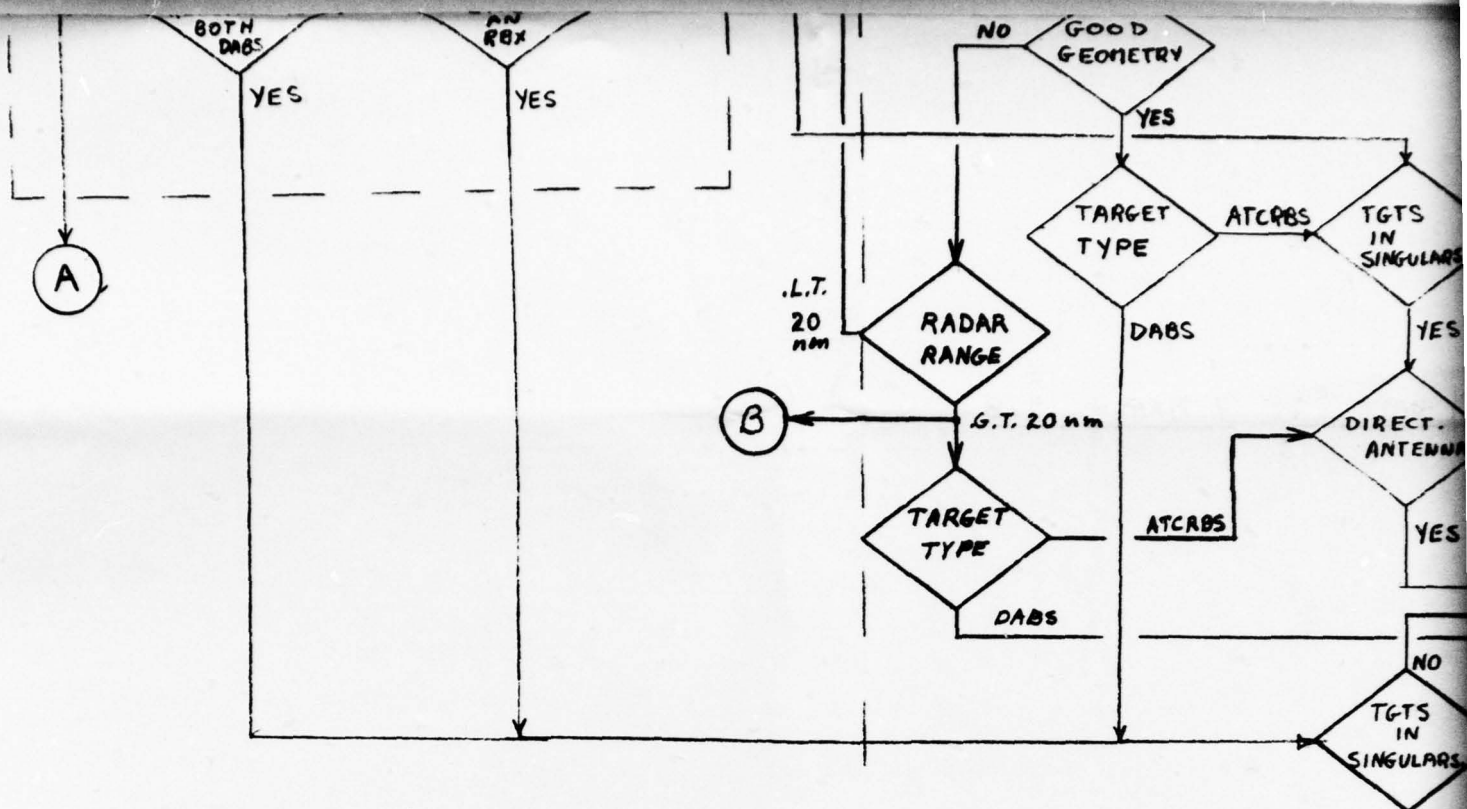
, 20 NM FROM RADAR

TO MODE SELECTION AND CONTROL

AND BRANCH

10

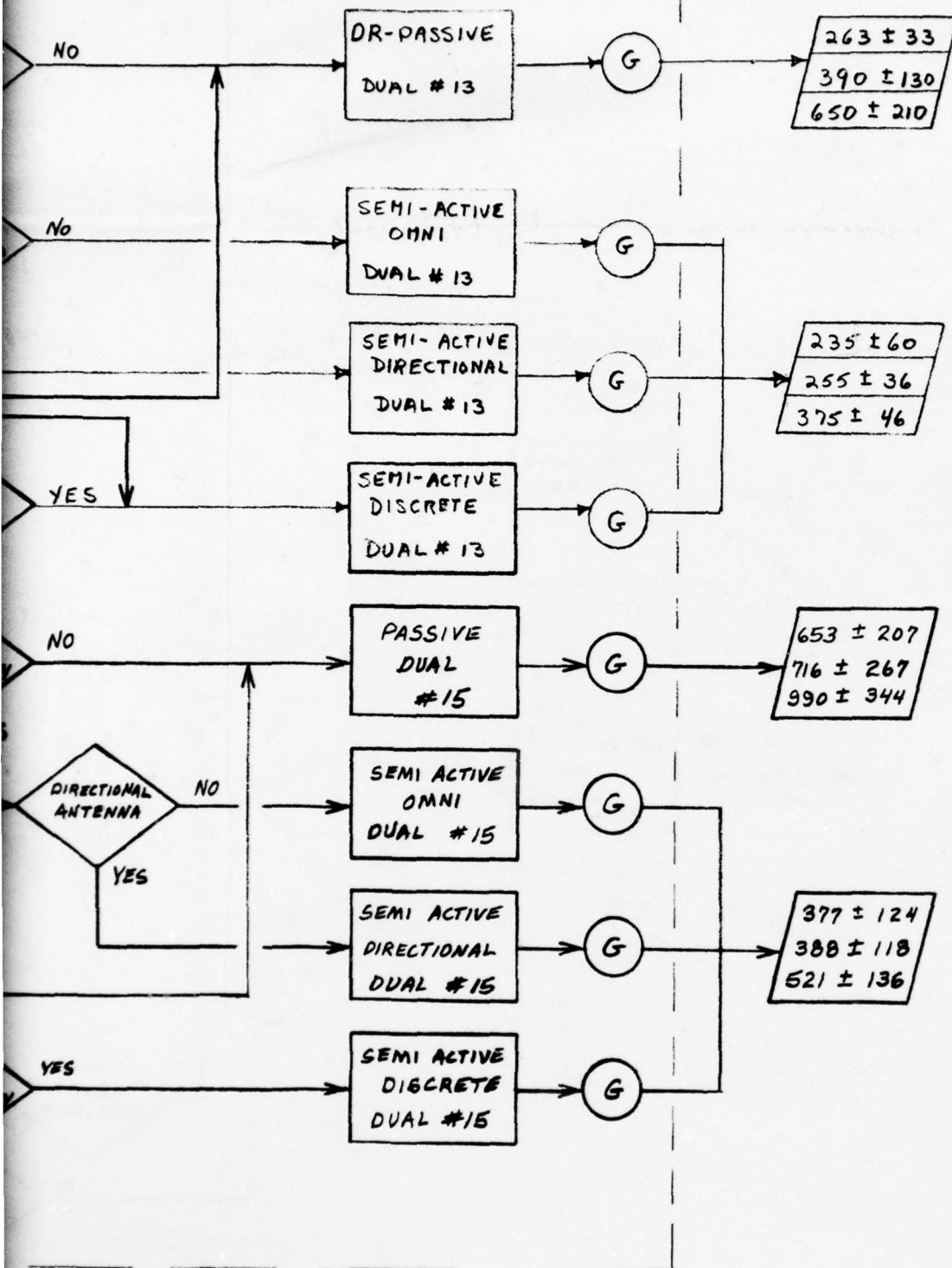




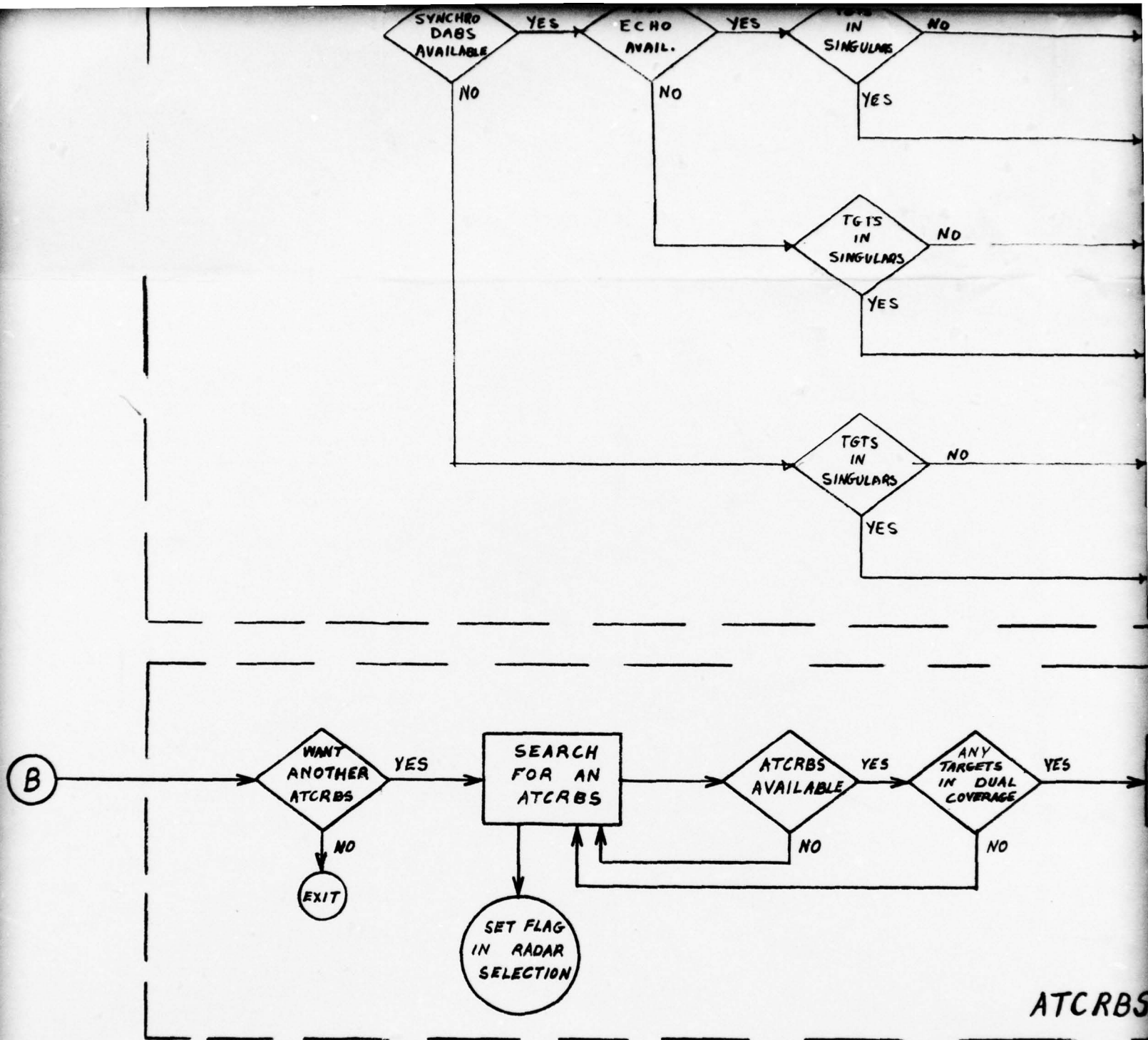
11



DABS/DABS  
DABS/ATCRBS  
ROR/ATCRBS

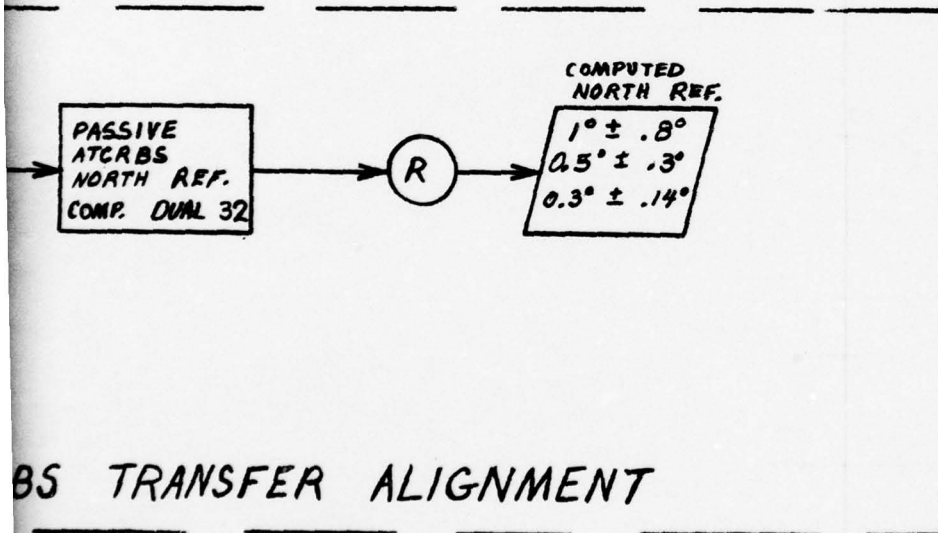
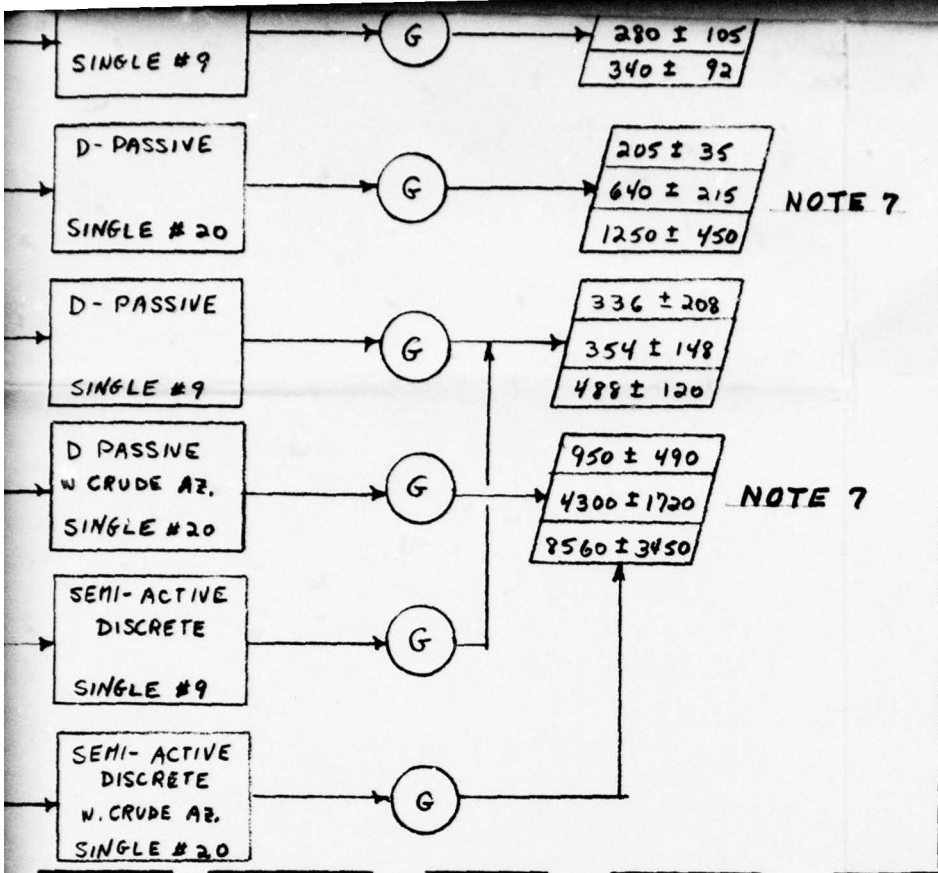






ATCRBS





**FIGURE B-1**

**TITLE :** BCAS MODE S

**DATE :** 9 MARCH, 1978

REV. #	REVISION DESC
1	ADD NOTES TO FL
2	DIRECTIONAL ACT
3	ATCRBS TRANSFER
4	DUAL MODE ADD
5	1030/1080 SIGNAL P

3.



SELECTION AND CONTROL LOGIC (DETAILED FLOW)

DESCRIPTION	DATE
FLOW CHART	PWH 3-9-78
ACTIVE GARBLE DETAIL & ATCRBS MODE	PWH 3-20-78
ER ALIGNMENT	PVH 3-28-78
ADDED DUAL #15 AND BRANCHES TO ©	PVH 3-30-78
L PROCESSORS REPLACED BY REPLY PROCESSOR	PVH 4-03-78
ORIGINAL DRAWN BY: <i>EJK</i>	